



How does absorptive capacity influence the origin and evolution of dynamic capabilities?

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Thesis submitted for MPhil, Cranfield School of Management

February 22nd, 2010

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For Emilia and Tom, your boundless love and laughter gives me a deep happiness.

This is for you.

Acknowledgments

Thanks to Professor Simon Knox for his valued advice, encouragement, belief and patience.

Thanks to all at the case-study firm who participated. Special thanks to Peter Kragh for his friendship, support, enthusiasm and continual championing of Strategyn UK throughout Europe.

Abstract

In this thesis, I deploy a *qualitative case-study method* to examine the influence of a firm's absorptive capacity of external knowledge on the origin and evolution of dynamic capabilities.

First, I make an attempt to reduce some of the conceptual and definitional confusion in the dynamic capabilities literature by developing and then validating a conceptual framework for their study in the field.

Second, to examine the underlying mechanisms leading to the origination and evolution of dynamic capabilities, I call on recent literature on the absorptive capacity construct that calls for more understanding of how absorptive capacity can produce and develop dynamic capabilities. I do so in the context of stated weaknesses in the absorptive capacity literature, namely that there is an R&D functional bias, a scientific and technical knowledge content bias (linked to R&D) at the expense of process knowledge, and a methodological preference for quantitative, descriptive studies.

Third, with absorptive capacity as my lens – specifically potential absorptive capacity which is only concerned with the acquiring and assimilation, not the application, of new external knowledge by a firm (after Zahra and George, 2002) - I make an attempt to reveal the constituent processes of dynamic capabilities.

Fourth, I discuss and reflect whether the development of absorptive capacity can be a dynamic capability in itself and what effects, if any, absorptive capacity has on existing or new dynamic capabilities and the firm's resource base.

Finally, by focusing on dynamic capabilities as processes (or the “how” of change) and absorptive capacity of knowledge of customer needs as the content (or the “what” of change) that is flowing through those processes, I make a tentative contribution to calls for the integration of the divergent research streams of strategy as process and strategy as content (Helfat with Maritan, 2007).

Glossary of terms

Term	Definition
Absorptive Capacity	“A set of organisational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organisational capability ... pertaining to knowledge creation and utilization, which enhances a firm’s ability to gain and sustain a competitive advantage” (Zahra and George, 2002: 186)
Assets	The resources owned by a firm
Concept Generation/Testing	A dynamic capability for generating product or service concepts which define an outline technological solution and business case that addresses a customer need or needs or market or technological opportunity. The capability involves the use of a variety of structured brainstorming and creativity techniques. Concept testing is the process of using quantitative methods and qualitative methods to evaluate consumer response to a product concept prior to development of the concept.
Customer Need	Knowledge about customer experiences, creativity, contribution and (dis)satisfaction with a firm’s and its competitor’s products and services. May also include the competencies, as well as tacit and explicit knowledge held by and captured from customers;
Dynamic Capability	A dynamic capability is “the capacity of an organization to purposefully create, extend or modify its resource base” (Helfat et al, 2007: 3)
Incremental dynamic capability	Dynamic capabilities that “continually improve the resource base, particularly in stable market conditions where the incremental improvement of resource is sufficient to sustain performance” (Ambrosini, Bowman and Collier, 2009: S14)
Learning Mechanisms	Underlying explicit and implicit experience accumulation, knowledge articulation and knowledge codification mechanisms that help to evolve dynamic capabilities (after Zollo and Winter, 2002)
Learning Routines	See Learning Mechanisms

Market Knowledge	Knowledge about competitors, market trends, industry performance, products and services
Micro-Foundation	The organisational and managerial processes, procedures, systems and structures that underpin a dynamic capability
Operating Capability	Capabilities that enable the firm to execute its main operating activities such as making or selling products or delivering services (Helfat and Peteraf, 2003; Winter, 2003; Zahra, Sapienza and Davidsson, 2006). The process of product development represents a typical operating capability as it serves the firm's current means of generating revenue and profit.
Operating Routines	See <i>Operating Capability</i>
Potential Absorptive Capacity	Potential absorptive capacity includes knowledge acquisition and assimilation, captures efforts expended in identifying and acquiring new external knowledge, and in assimilating knowledge obtained from external sources
Product	Any tangible or intangible product or service that a firm produces to generate rent.
Product Portfolio Planning	A dynamic capability that entails the selection and planning of product development projects based on criteria that the organization deems most appropriate for its strategic needs (e.g. expected commercial value, strategic balance between high and low risk projects or a range of technical and market scorecards). These selections require evaluation of whether the firm has the necessary operating capabilities. Where gaps are noted, further operating capability investments need to be made. Project selection and capability development, in turn, trigger resource allocation and the development of individual projects commences. The dynamic capability of portfolio planning has thus engineered the configuration of the necessary operating capabilities based on the product and technology roadmaps of the organization in order to fulfil current and future competitive requirements. (after Newey and Zahra, 2009)
Product Concept	The artefact produced from concept generation, maybe in the form of a prototype or a document that summarises the product concept
Realised absorptive capacity	Realized absorptive capacity, which includes knowledge transformation and exploitation, encompasses deriving new insights and consequences from the combination of existing and newly acquired knowledge, and incorporating transformed knowledge into operations.
Regenerative dynamic	Dynamic capabilities that regenerate the current set of

capability	dynamic capabilities and would be used when managers perceive a threat or disruption to their business environment that risk making the current set of dynamic capabilities inappropriate. A firm needs regenerative dynamic capabilities if the dynamic capabilities it has are no longer relevant, or do not allow the firm to 'achieve new resource configurations as markets emerge, collide, split, evolve and die' (Eisenhardt and Martin, 2000, p. 1107). Regenerative dynamic capabilities are a form of meta-capabilities but are defined precisely as being dynamic capabilities impacting on dynamic capabilities, rather than the more general definition that they are capabilities 'of the "learning to learn" variety' (Collis, 1994, p. 143). (Ambrosini, Bowman and Collier, 2009)
Renewing dynamic capability	Dynamic capabilities that adjust the mix of the extant resource stock in situations where there is more dynamism in the market environment; they refresh and renew the nature of the resource base rather than incrementally adapt it and are needed as resource-based advantages may be being rapidly eroded. (Ambrosini, Bowman and Collier, 2009)
Resource Base	Tangible, intangible and human assets including organisational knowledge as well as capabilities which the organization owns, controls or has access to on a preferential basis
Target Product Profile	A Target Product Profile (TPP) defines the terms of reference for the development of a product concept. It contains an assessment of a market opportunity based on knowledge of unmet customer needs. TPPs are used by R&D concept generation and development teams.
Technical Knowledge	Technological and scientific knowledge and capabilities needed to define the function and operation of product solutions
User	The term used by the firm in the case-study for a customer

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OVERVIEW

Research question

How does absorptive capacity influence the origin and evolution of dynamic capabilities?

Layout of the paper

The paper is organised into five sections.

The first section presents the reasons why the research topic was chosen and sets out the research objectives and expected contributions.

The second section reviews the literature and explains how I have organised and selected the main sources. Here I develop my arguments and the area of focus of my research.

The third section describes the reasons for choosing the research question, the choice of research method and sets out the research design used to conduct the empirical work.

The fourth section presents the empirical findings from the research.

In the final section, I reflect on the findings and present my conclusions.

SECTION ONE: RESEARCH RATIONALE, QUESTION AND CONTRIBUTION

Research rationale

The field of strategic management is concerned with how firms create and sustain competitive advantage over time. The *resource-based view of the firm (RBV)* is one popular strategic management perspective that suggests that the actions which sustain a firm's competitive position require it to possess very specific bundles of resources, competencies and capabilities (Penrose, 1959; Wernerfelt, 1984; Spender, 1996; Barney, 1991; Peteraf, 1993). Those that lead to competitive advantage must by definition be simultaneously valuable, rare, imperfectly imitable and imperfectly substitutable or VRIN (Barney, 1991) and are "unlikely to be available from others under terms that do not strip them of the net present value of the rent stream they are capable of generating" (Rumelt, 1987: 143). Resources are heterogeneous in their distribution across firms and persist over time (Amit and Schoemaker, 1993; Mahoney and Pandian, 1992; Penrose, 1959; Wernerfelt, 1984).

Despite its popularity, the main criticism of the RBV is that it is an essentially *static* view of the firm. It neither explains how future valuable resources are created nor how a firm's existing resource base can be renewed in the face of changing markets and environments. This is the concern of the *dynamic capabilities framework* which emerged in the late 1990s. Dynamic capabilities help to determine how resources evolve over time and how competitive advantage may be sustained. The concept extends RBV by seeking to understand how firms grow and therefore links to theories of the firm and firm growth, particularly those of Schumpeter (1934), Penrose, (1959) and Nelson and Winter (1982).

Building on RBV and linked to dynamic capabilities, researchers argue that the concept of organisational knowledge is capable of explaining the nature and behaviour of firms (e.g. Kogut and Zander, 1996; Nahapiet and Ghoshal, 1998). From this perspective, firms are described as "repositories of knowledge" (Conner, 1991; Conner and Prahalad, 1996) that are embedded in assets (Teece, 1998), rules (Levitt and March, 1988), routines (Nelson and Winter, 1982), standard operating procedures (Cyert and March, 1963) and dominant logics (Bettis and Prahalad, 1995; Prahalad and Bettis, 1986). Authors holding this view argue that the primary role of the firm and the essence of organisational capability is the integration of knowledge (Grant, 1996; Spender and Grant, 1996). They posit that firms exist because they can integrate and coordinate specialized knowledge held by individuals into collective, organisational knowledge. In turn, that leads to advantage because with all things being equal, knowledge is difficult to copy, is causally ambiguous and, typically, beyond the grasp of rivals. When knowledge is valuable and used appropriately, firms can enjoy sustained competitive advantage. In short, firms are better than markets at integrating and applying valuable knowledge to business activity.

Emerging at roughly the same time as the RBV, the construct of absorptive capacity has been used to explain a wide variety of organisational phenomena related to knowledge use within the firm and innovation performance. Located between the

fields of dynamic capabilities, the knowledge-based view of the firm and organisational learning (Easterby-Smith et al, 2008), absorptive capacity was first defined as the ability of a firm to “recognize the value of new, external information, assimilate it, and apply it to commercial ends” (Cohen and Levinthal, 1990:128). Absorptive capacity is said to be critical to a firm’s long-term survival and success because it can strengthen, complement and refocus the firm’s existing knowledge base. Given that organisational knowledge is an important asset in the resource-based view of the firm, there exist clear linkages between absorptive capacity, RBV and the dynamic capabilities framework. Indeed, authors argue that by understanding absorptive capacity, it is possible to understand how firms create, modify or extend their resource base through dynamic capabilities. Some authors argue that absorptive capacity is a capability in its own right. For example, Cohen and Levinthal (1990) termed absorptive capacity a “capability” (before the dynamic capabilities framework was introduced). More recently, Zahra and George (2002: 187) are unequivocal in their assertion that “absorptive capacity is a dynamic capability that influences the firm’s ability to create and deploy the knowledge necessary to build other organisational capabilities”.

Running in parallel yet rarely linked to the literature on absorptive capacity, is an important body of research focused on market orientation and the related concept of market learning. Such market insights place great emphasis on the ability of a firm to generate, disseminate and use superior information about customers and competitors (Kohli and Jaworski, 1990; Narver and Slater, 1990). This literature states that market-learning is valuable to a firm’s customers because it focuses on understanding and effectively satisfying their expressed and latent needs through new products, services and ways of doing business (Day, 1994a, 1994b; Sinkula, 1994). Slater and Narver (1995) suggest that market-learning should lead to directly to superior firm outcomes such as greater new product success, superior customer retention, higher customer defined quality, and ultimately superior growth and/or profitability.

Despite the prominence of the market learning concept in the literature, few authors have linked market learning with absorptive capacity, RBV and dynamic capabilities which perhaps is surprising. In fact, nearly all empirical work on absorptive capacity to date has been concerned with the search, gathering and assimilation of scientific and technological knowledge with the research and development (R&D) function acting as the focal point of such activities. This is a weakness in the literature as it assumes that R&D is where all aspects of innovation take place within firms. It also assumes that firms first produce product concepts themselves (using their internal ideas and knowledge) and then search external knowledge sources for the technological knowledge they need to develop those concepts. As firms begin to develop a market orientation, such an R&D-centric approach may be replaced with a market-driven approach, characterised by firms first searching for market opportunities and then selecting those that are most attractive to focus their concept and product development activities, and subsequent technological knowledge search activities. Teece (2009), the founder of the dynamic capabilities framework, states that search strategies for market knowledge differ from those for exogenous science and technology developments and that firms must build new micro-foundations of

dynamic capabilities for what he terms, “sensing and seizing market and technological opportunities”. He continues:

“Management must find methods and procedures to gain insight.... This involves gathering technological, market and competitive information from both inside and outside the enterprise, making sense of it, and figuring out implications for action.” (Teece 2009: 16).

With Teece’s (2009) emphasis on search and interpretation of opportunities (market, competitor and technological), it is possible to make a link to the absorptive capacity literature. However, as I mention, few researchers have so far examined the role of absorptive capacity in the acquisition, assimilation, and commercial application of market knowledge. Others have reached similar conclusions. For example, Sawhney and Prandelli (2000) argue that firms must begin to develop an absorptive capacity for knowledge about and from *customers*; that is, an ability to recognise the value of the knowledge held in dialogue with *customers*, and then to sense and to incorporate it within the firm.

Despite the clear linkages and the calls from the various authors described above, to date there have been no studies of absorptive capacity that have been centrally concerned with the acquisition, assimilation and application of market knowledge. In particular, there have been no studies of absorptive capacity of new market knowledge in situations where a firm has deliberately sought to renew its existing knowledge base. Equally, few studies have directly examined the influence of the underlying mechanisms used to acquire and assimilate external knowledge on the origin and evolution of dynamic capabilities. Hence, these three research gaps combine to determine my research question, which is:

How does absorptive capacity influence
the origin and evolution of dynamic capabilities?

Before I proceed, briefly I describe my personal rationale for conducting the research.

Rationale from my perspective

As a consultant and practitioner with particular experience in helping firms to renew their innovation capabilities, for many years I have been interested in the different approaches and the varying importance that firms have when acquiring, assimilating and applying external market and customer knowledge. My experiences working with firms in all industry sectors has led me to questions of how and why firms originate, evolve and refine capabilities for using different types of internal and external knowledge, whether technical, market, customer, competitor or other types. It is this curiosity that led me to embark on this research programme and to determine my research question.

This research is also performed in a context in which innovation is of increasing importance to competitive success and in which environment dynamics compel organizations to frequently reconfigure their knowledge and resource base in order to achieve competitive advantage. My professional work is interested in understanding

and developing managerial applications arising from the dynamic capabilities perspective, particularly for superior innovation performance.

I now summarise the research objectives which this study aims to address.

Research objectives

I identify three primary objectives for the research:

1. *To advance understanding of the nature, origin and evolution of dynamic capabilities* The research will seek to elaborate on existing theories by building from the literature and then testing a conceptual framework for the study of dynamic capabilities
2. *To advance understanding of the relationship between absorptive capacity and the origin and evolution of dynamic capabilities* The research will seek to determine how the mechanisms used to acquire external knowledge and the factors governing firm's ability to assimilate the new knowledge influence the origin and evolution of new and existing dynamic capabilities.
3. *To identify whether under certain conditions absorptive capacity can be itself defined as a dynamic capability* Finally, I attempt to clear up some of the confusion in the literature concerning whether absorptive capacity itself can be classed as a dynamic capability.

I now summarise the research design deployed to address the above objectives.

Research design

I deploy a *qualitative, retrospective case-study method* to identify the dynamics and mechanisms of absorptive capacity and how they influence the origin and evolution of dynamic capabilities within a single case setting. I do not wish to generate theory but rather seek to provide a description of absorptive capacity and its influences on dynamic capabilities. Through interviews and recording of the activities undertaken by individuals and teams, my goal is to obtain evidence of what dynamic capabilities look like in the case-study firm, their underlying knowledge-related and learning mechanisms and how they originated and how they have been deployed.

The firm chosen as the case-study has made a deliberate attempt to acquire and assimilate new external market knowledge for innovation by shifting the focus of its knowledge inputs from technological and scientific knowledge to knowledge of customer needs.

Academic contributions

This research makes a number of contributions to the literature.

First, I seek to make a contribution regarding the nature, origin and evolution of dynamic capabilities. I make an attempt to reduce some of the conceptual and definitional confusion in the current literature regarding dynamic capabilities by developing and then validating a conceptual framework for their study in the field.

Second, to examine the underlying mechanisms leading to the origination and evolution of dynamic capabilities, I call on recent literature on the absorptive capacity construct that calls for more understanding of the how absorptive capacity can produce and develop dynamic capabilities. I do so in the context of stated weaknesses in the absorptive capacity literature, namely that there is an R&D functional bias, a scientific and technical knowledge content bias (linked to R&D) at the expense of process knowledge, and a methodological preference for quantitative, descriptive studies.

Third, with absorptive capacity as my lens – specifically potential absorptive capacity which is only concerned with the acquiring and assimilation, not the application, of new external knowledge by a firm (after Zahra and George, 2002) - I make an attempt to reveal the constituent processes of dynamic capabilities. Through a case-study, I examine the underlying development, deployment and learning mechanisms that can drive the regeneration of existing operating and dynamic capabilities, the creation of new ones as well as the creation, modification or extension or renewal of a firm's knowledge resources.

Fourth, I discuss and reflect whether the development of absorptive capacity can be a dynamic capability in itself and what effects, if any, absorptive capacity has on existing or new dynamic capabilities and the firm's resource base.

Finally, by focusing on dynamic capabilities as processes (or the "how" of change) and absorptive capacity of knowledge of customer needs as the content (or the "what" of change) that is flowing through those processes, I make a tentative contribution to calls for the integration of the divergent research streams of strategy as process and strategy as content (Helfat with Maritan, 2007).

Next, I review the literature and begin to formulate my research focus.

SECTION TWO: LITERATURE REVIEW

Choice and structure of the literature

The purpose of the literature review is to provide the background to the research study and to identify the gaps where the research is intended to make a contribution. This section reviews the literature appropriate to the research question. It describes my choice of literature and the relationships between them.

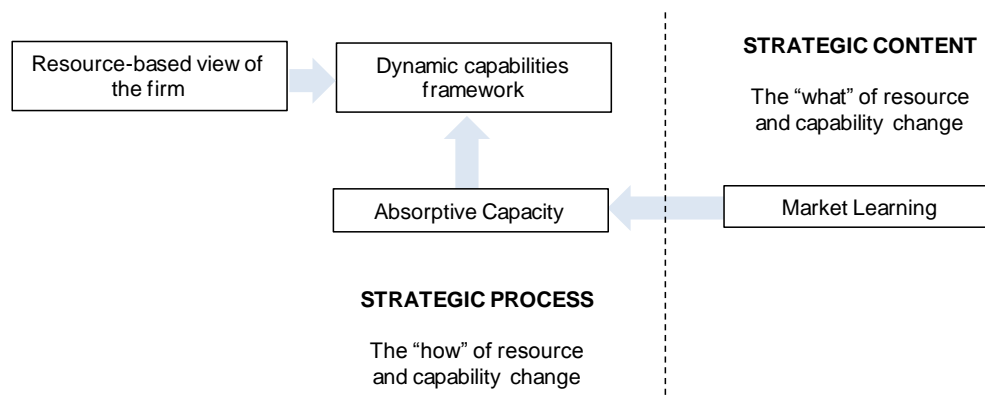


Figure One – The structure of the literature

In Figure One, I depict the four bodies of literature that are relevant to my research question. These are: (1) Resource-based view of competitive advantage, (2) the dynamic capabilities framework, (3) the construct of absorptive capacity, and (4) the literature on market learning. All are viewed through a theoretical lens that is concerned with the existence, growth and evolution of the firm.

I divide the literature streams into two groups:

- 1) Those concerned with the “how” of resource and capability change or *Strategic Process*
- 2) That concerned with the “what” of resource and capability change or *Strategic Content*

As described by Helfat with Maritan (2007), there exists a long-standing belief in the field of strategic management that there is a divide between the “process-side” and the “content-side” of strategy. They state that these fields continue to reside in separate domains with researchers examining each through different philosophical and epistemological lenses. The process side concerns questions such as “how strategies are formed, implemented and changed” (Chakravarthy and White, 2002: 182). It is concerned with mechanisms, systems and organisational practices and is inherently chronological and dynamic in nature. The content side of strategy research on the other hand, concerns questions of what strategies to form as well as their impact on market performance, and considerations of the scope of the firm and matters of competition. Importantly, the two sides of the strategic management field require different forms of knowledge which can be termed “process know-how” and “content know-what”. I return to this distinction later in the research.

Briefly, I now explain my rationale for choosing the literature sets shown in Figure One.

1) *The resource-based view of the firm*

Innovation is of increasing importance to competitive success. Firms must shape and respond to fast-changing markets and other environment dynamics to achieve and sustain competitive advantage. The resource-based view of the firm states that the characteristics of individual firms (or their resources) explain variations in firm performance more successfully than characteristics of industry (Teece, 2009). In this way, the RBV questions external market positioning strategic perspectives, particularly those of Porter (1990). In the RBV, the resource base consists of tangible and intangible assets, existing capabilities and routines which together enable the firm to create and sustain value propositions. The creation, ownership, management and deployment of intangibles, especially knowledge and relationships, explain variations in the performance of firms, especially those that are heterogeneously distributed by being valuable, rare, imperfectly inimitable and imperfectly substitutable (or VRIN as defined by Barney, 1991). When resources are not available from the market, they must be built, nurtured and renewed within the firm. RBV therefore stresses the role of managers, their perceptions of market change and opportunities and the decisions and investments they make to create, modify and renew the firm's resource base.

The RBV literature provides me with the lens I need for examining intangible assets, particularly knowledge, within the firm as well as how managers might influence the development, deployment and orchestration of those assets. It concerns questions of how firms can harness their resources to achieve competitive advantage.

2) *The dynamic capabilities framework*

Criticisms of the RBV centre on its lack of dynamism. It is a largely static view of the firm and does not explain how firms might change their resource base to sustain competitive advantage through firm evolution. The dynamic capabilities framework attempts to compensate for this shortcoming. It seeks to understand how firms create, modify or extend their resource base by highlighting the nature, origin and development of firm-level capabilities. It draws upon evolutionary economic theory (e.g., Nelson and Winter, 1982) and has close links with innovation as a driver of firm growth. Research on dynamic capabilities fundamentally concerns *how* firms emerge, grow, develop, change and rejuvenate (Helfat with Maritan, 2007). In short, I select this literature because it concerns matters of the *how* of strategic change.

3) *The construct of absorptive capacity*

Paradoxically, most research on dynamic capabilities to date has been concerned with "what" questions; *what* defines them, *what* distinguishes them from other capabilities and *what* their effect is on firm-level outcomes (Helfat with Maritan, 2007). Whilst these are important and I include them in the literature review, there has been little attention on the "how" of dynamic capabilities; that is, *how* do they originate, *how* are they developed, *how* are they deployed and *how* are resources reconfigured, co-aligned and integrated to achieve competitive advantage. In order to understand the "how" questions of dynamic capabilities, I need to select a literature stream with a clear linkage to the dynamic capabilities framework yet which has a specific knowledge process component. Absorptive capacity focuses on the knowledge resources within the firm and the learning mechanisms it deploys to acquire assimilate and apply

external knowledge. By identifying and tracking the effects on capabilities and the resource base of a firm arising from the use of new external knowledge, I hope to be able to reveal the underlying mechanisms or the “how” of the origination, development and deployment of a dynamic capability.

4) *Market-learning*

Finally, I need a literature set that provides evidence and justification of how and why some firms are gathering, assimilating and applying new forms of market and customer knowledge to drive innovation and improve market performance. This provides the rationale for selecting knowledge of customer needs as an asset in the resource base and the market learning processes that firms might deploy to assimilate and apply it in their innovation activities.

Having presented a brief discussion of my reasons for choosing each literature set, I now review each literature set in more detail, beginning with the resource-based view of the firm.

Literature Set 1: Resource-based view of the firm

The resource-based view of the firm (RBV) is a perspective for understanding how competitive advantage within firms is achieved and sustained over time (Barney, 1991; Penrose, 1959; Peteraf, 1993). RBV suggests that the strategic actions which position the firm require it to possess very specific bundles of resources, competencies and capabilities (Wernerfelt, 1984; Spender, 1996). Those that lead to competitive advantage must by definition be simultaneously valuable, rare, imperfectly imitable and imperfectly substitutable or VRIN (Barney, 1991) and are “unlikely to be available from others under terms that do not strip them of the net present value of the rent stream they are capable of generating” (Rumelt, 1987: 143). Resources are heterogeneous in their distribution across firms and persist over time (Amit and Schoemaker, 1993; Mahoney and Pandian, 1992; Penrose, 1959; Wernerfelt, 1984). RBV is concerned with the internal organization of firms, and acts as a corollary to the external industry structure and positioning view of strategy as a key determinant of competitive advantage (Porter, 1979, 1980). Barney (1991, p101) states that “...firm resources include all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc; controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness”.

Conner (1991) compared RBV with other branches of industrial and firm economic theory, namely neoclassical theory’s perfect competition model, Bain-type IO, the Schumpeterian and Chicago responses, and transaction cost theory. She drew three important conclusions:

1. First, resources available to the firm are not homogenous and openly tradeable, thereby refuting the perspective of both neo-classical perfect economics and the Chicago School to explain firm differentiation.
2. Second, restricting output in the classical Bain/Mason tradition (Bain, 1951) and Mason (1939) is not a sustainable strategy, because competitors will always find ways to circumvent monopoly power in the longer-term.

3. Third, RBV differs from Coase's (1937) Transaction Cost Theory as it regards the firm as a creative entity that seeks to build sustainable competitive advantage through customer value creation ("value-maximisation") and not an entity characterized by opportunistic, cost-reducing behaviour ("cost-minimisation") or efficiency.

Conner concludes that RBV is rooted in the Schumpeterian evolutionary tradition of firms seeking new ways to compete through learning, innovation and adaptation.

Building on RBV, many researchers argue that the concept of organisational knowledge is capable of explaining the nature and behaviour of firms (e.g. Kogut and Zander, 1996; Nahapiet and Ghoshal, 1998). Firms have been described as "repositories of knowledge" (Conner, 1991; Conner and Prahalad, 1996) that is embedded in assets (Teece, 1998), rules (Levitt and March, 1988), routines (Nelson and Winter, 1982), standard operating procedures (Cyert and March, 1963) and dominant logics (Bettis and Prahalad, 1995; Prahalad and Bettis, 1986). Others argue that the primary role of the firm and the essence of organisational capability is the integration of knowledge (Grant, 1996; Spender and Grant, 1996). They posit that firms exist because they can integrate and coordinate specialized knowledge held by individuals into collective, organisational knowledge. In turn, that leads to advantage because with all things being equal, knowledge is difficult to copy, is causally ambiguous and typically, beyond the grasp of rivals. When knowledge is valuable and used appropriately, firms can enjoy sustained competitive advantage. In short, firms are better than markets at integrating and applying valuable knowledge to business activity.

A resource-based view of the firm provides management with an entrepreneurial decision-making and value-creation role that is relevant when researching capabilities for absorptive capacity. It also acknowledges the importance of knowledge – and how knowledge is gained – to seek competitive advantage in markets. As described by Helfat et al (2007: 4), the resource-base of the firm consists of "tangible, intangible and human assets as well as capabilities which the organization owns, controls or has access to on a preferential basis." Adding organisational knowledge to this collection of resources, I shall use this definition to provide the first component of the conceptual framework used to guide the research in this study (see Figure Two).

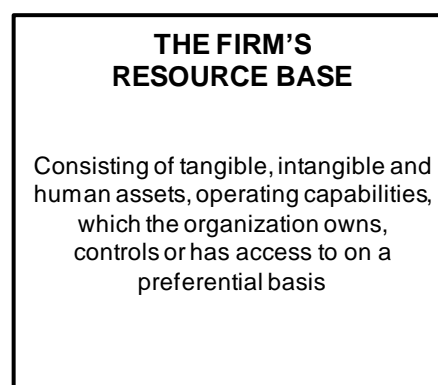


Figure Two – The Firm's Resource Base: The first component of the conceptual framework

Weaknesses in the Resource-Based View literature

Many authors cite a single important weakness with RBV. This is the lack of theorizing with respect to the creation of new resources, which tends to give the perspective a retrospective or static character and makes its application to managerial practice difficult (Foss, 1998; Priem and Butler, 2001). In other words, there is a lack of a coherent treatment of “dynamics” or “evolution”, and the actual mechanisms or processes firms deploy to renew, modify or create new resources. Another important problem with RBV cited by researchers is the amount of terminological ambiguity with various concepts such as “resources”, “competences” and “capabilities” (Foss, 1998). Both of these weaknesses are addressed in the dynamic capabilities literature, which I now summarise.

Literature Set 2: The dynamic capabilities framework

The RBV does not explain how future valuable resources are created or how a firm’s existing resource base can be renewed in the face of changing markets and environments. This is the concern of the dynamic capabilities framework which is seen as an extension of RBV and helps to determine how resources evolve over time and how competitive advantage may be sustained.

The roots of the dynamic capabilities framework can be traced back to Penrose (1959) and her *Theory of the Growth of the Firm*. She viewed firms as ‘administrative organizations that are collections of heterogeneous productive resources that have been historically determined’. Clearly, there is a link from Penrose to RBV. Penrose also stressed that value creation does not come from the possession of the resources alone. Rather, it arises from their use, and the amount of value generated is linked to how resources are deployed, i.e. how they are combined within the firm. In this way, Penrose argues that to grow, firms must continually develop their expertise and to innovate, and that managers need to have entrepreneurial skills rather than managerial skills. Finally, she suggests that managers are the ultimate constraint to the growth of a firm, as managers are limited by their knowledge of their firm’s resource base and their understanding of their external environment (Lockett and Thompson 2004). Penrose view of firm growth is a clear precursor to dynamic capabilities thinking.

Nelson and Winter’s (1982) *An Evolutionary Theory of Economic Change* also greatly influenced the dynamic capabilities framework, particularly in developing understanding of their definition, nature, components and relationship to existing organisational capabilities within the resource base. Evolutionary theory addresses the importance of organisational routines and how they shape and constrain the ways in which firms grow and cope with changing environments. It states that firms can be understood in terms of a hierarchy of practiced organisational routines which define lower order organisational skills and higher-order decision procedures for choosing what is to be done at lower levels. The absence of either lower order or higher order routines for invoking them constrains the organization’s capacity to innovate. Nelson and Winter (1982) take an efficiency approach to firm performance rather than the privileged market position approach central to Porter’s (1980) theory of competitive advantage. They also emphasize internal factors of the firm rather than external

factors as sources of competitive advantage. Like Nelson and Winter (1982), Teece et al. (1997) highlight the importance of path dependencies, and the need to reconfigure a firm's resources to enable the firm to change and evolve. It was Teece et al (1990) that first articulated the dynamic capabilities framework.

The origins of the dynamic capabilities framework

Teece et al (1990) introduced the notion of dynamic capabilities. They sought to enhance RBV stating that (1990, 11) 'our view of the firm is somewhat richer than the standard resource-based view ... it is not only the bundle of resources that matter, but the mechanisms by which firms learn and accumulate new skills and capabilities, and the forces that limit the rate and direction of this process'. They believe dynamic capabilities explain why successful firms are able to display 'timely responsiveness and rapid and flexible product innovation, along with the management capability to effectively coordinate and redeploy internal and external competences' (Teece and Pisano, 1994: 537). They point out that it is essential to consider the changing nature of the external environment and hence the role of strategic management, which is principally about 'adapting, integrating and reconfiguring internal and external organisational skills, resources and functional competencies toward the changing environment' (Teece and Pisano, 1994: 537). Their argument is derived from a realization that many once successful firms struggle or fail as their environment changes; in essence, they are unable to adapt successfully. Teece's early work was then further elaborated upon in Teece, Pisano and Shuen (1997) when they explicitly argue how the dynamic capability view can overcome the limitations of the RBV. In this paper, they define dynamic capabilities as,

'The firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (1997, 516).

Dynamic capabilities allow firms continually to have a competitive advantage and may help firms to avoid developing core rigidities which inhibit development, generate inertia and stifle innovation (Leonard-Barton, 1992). Ambrosini and Bowman (2009) state that core rigidities are the opposite of VRIN resources. They are resources that have become obsolete, are no longer valuable and may inhibit the development of the firm. In other words, they are resources that have not been appropriately adapted, upgraded or restructured through dynamic capabilities. By altering the organization's resource base, dynamic capabilities may open new strategic alternatives or "paths" for the firm (Helfat, 1997).

Since Teece et al's (1997) review and often-cited definition, there have been several attempts to understand and extend the dynamic capabilities perspective by many scholars with different research backgrounds using different lenses. Next, I review this literature.

Dynamic capabilities: Definition, constituents, origin and evolution

Easterby-Smith, Lyles and Peteraf (2009) state that without a thorough analysis of what dynamic capabilities are, what constitutes them, where they come from and how they can be recognised, any empirical work to examine their origin and evolution will

be misdirected. In this section, I take-up their suggestion by reviewing different perspectives found in the literature concerning the definition, components, types and other methodological-related aspects of dynamic capabilities. At its conclusion, I summarise the primary characteristics that define dynamic capabilities to guide my empirical research. Throughout the section, I build a conceptual framework of the core components of dynamic capabilities to guide the study.

Table One – Different Definitions of Dynamic Capabilities

Author(s)	Different Definitions of Dynamic Capabilities
Teece, Pisano and Shuen (1997: 516)	The firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments
Eisenhardt and Martin (2000: 1107)	The firm's processes that use resources ... to match and even create market change. Dynamic capabilities thus are the organisational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve and die.
Zollo and Winter (2002: 340)	A learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating capabilities in pursuit of improved effectiveness
Winter (2003: 991)	Dynamic capabilities 'are those that operate to extend, modify or create ordinary capabilities'
Zahra et al. (2006: 918)	The abilities to reconfigure a firm's resources and routines in the manner envisioned and deemed appropriate by its principal decision-maker
Wang and Ahmed (2007: 35)	A firm's behavioural orientation constantly to integrate, reconfigure, renew and recreate its resources and capabilities and, most importantly, upgrade and reconstruct its core capabilities in response to the changing environment to attain and sustain competitive advantage
Helfat et al. (2007: 1)	The capacity of an organization to purposefully create, extend or modify its resource base.
Newey and Zahra (2009: S81)	The ability of the firm to reconfigure operating capabilities and thus allow the organization to adapt and evolve

From analysis of the literature and the different definitions of dynamic capabilities and related key papers (see Table One), it is possible to identify five themes of discussion that have characterised the scholarly effort to understand dynamic capabilities. These are:

- 1) Resource Base and Performance Effects: Understanding dynamic capabilities in terms of their effects on the resource base and firm performance
- 2) Origin and intent: Understanding why and how dynamic capabilities originate in terms of the influence of the external environment and the nature or degree of managerial intent
- 3) Constituents: Understanding what dynamic capabilities consist of

- 4) Development: Understanding how dynamic capabilities develop and evolve
- 5) Deployment: Understanding how dynamic capabilities are deployed

In the remainder of this section, I summarise each of these themes. As I do so, I will build further the conceptual framework for this research study.

1) Resource Base and Performance Effects: Understanding dynamic capabilities in terms of their effects on the resource base and firm performance

The first distinction in the literature concerns the nature and extent of the resource base that is created, modified or renewed by dynamic capabilities or in other words, what effects do they have on the resource base of the firm? There are two perspectives here which I shall term the *holistic view of resources* and the *capability-based view of resources*.

In the *holistic perspective*, a firm's resource base is defined in its fullest sense as the "tangible, intangible and human assets including organisational knowledge as well as capabilities which the organization owns, controls or has access to on a preferential basis" (Helfat et al, 2007: 4). This implies that capabilities are also resources and that resources are in essence anything that the organization can draw upon to achieve its goals. By extension, holistic definitions imply that dynamic capabilities are also part of the resource base and that they themselves can be modified by other dynamic capabilities. For example, Helfat and Peteraf (2003) identify that when learning is regarded as a dynamic capability, it will usually extend or modify other dynamic capabilities as well as operational capabilities and other resources.

In contrast to the holistic view, the *capability view of the resource base* emphasises only an organization's *operating routines or operating capabilities* as the resources that are modified by dynamic capabilities. Zollo and Winter (2002) specifically identify *operating routines*, as opposed to more generic competencies, as the object on which dynamic capabilities act. They write, "Dynamic capability is exemplified by an organization that adapts its operating processes through a relatively stable activity dedicated to process improvements" (Zollo and Winter, 2002: 340). Newey and Zahra (2009) define *operating capabilities* as those that enable the firm to execute its main operating activities such as making and selling products or delivering services (Helfat and Peteraf, 2003; Winter, 2003; Zahra, Sapienza and Davidsson, 2006). They cite the process of product development as a typical operating capability as it serves the firm's current means of generating revenue and profit. They then define dynamic capabilities as the ability of the firm to reconfigure operating capabilities and thus allow the organization to adapt and evolve (Helfat et al., 2007; Teece, 2007; Zahra, Sapienza and Davidsson, 2006; Zollo and Winter, 2002).

Both the holistic and the capability view of the resource base suggest that there are distinct capability hierarchies with the firm. Collis (1994) proposes a four-level hierarchy of capabilities, the first being the resource base itself which includes operating capabilities, the second and third closely-related categories are both dynamic capabilities in terms of Teece, Pisano and Shuen's (1994) and Helfat et al.'s (2007) definitions although they differ as to whether they simply modify (second-

order), or create and extend, the resource base (third-order). The fourth category is what Collis (1994) labels 'higher order' or 'meta-capabilities' which relate to learning-to-learn capabilities. Danneels (2002) develops further Collis's (1994) ideas. He proposes two competency types: first-order competencies, which constitute the ability to achieve an individual task; and second-order competencies which are the firm's ability to renew itself through creating new first-order competencies. Winter (2003) develops further the concept of a capability hierarchy. He states that operating capabilities or zero-order capabilities allow firms to earn a living in the present (the resource base), whereas first-order capabilities change zero-order capabilities. He then introduces higher order capabilities that are the outcome of organisational learning which result in creating or modifying a firm's dynamic capabilities (first-order capabilities). Ambrosini, Bowman and Collier (2009) produce a new three-level typology of dynamic capabilities, synthesising all the previous attempts mentioned above. The three types of dynamic capability in this hierarchy, which I shall deploy in this research, are defined as:

- 1) *Incremental dynamic capabilities*: Used to continually improve the resource base, particularly in stable market conditions where the incremental improvement of resources is sufficient to sustain performance.
- 2) *Renewing dynamic capabilities*: Used to adjust the mix of the extant resource stock in situations where there is more dynamism in the market environment; they refresh and renew the nature of the resource base rather than incrementally adapt it and are needed as resource-based advantages may be being rapidly eroded.
- 3) *Regenerative dynamic capabilities*: Used to regenerate the current set of dynamic capabilities and would be used when managers perceive a threat or disruption to their business environment that risk making the current set of dynamic capabilities inappropriate. A firm needs regenerative dynamic capabilities if the dynamic capabilities it has are no longer relevant, or do not allow the firm to 'achieve new resource configurations as markets emerge, collide, split, evolve and die' (Eisenhardt and Martin, 2000, p. 1107). Regenerative dynamic capabilities are a form of meta-capabilities but are defined precisely as being dynamic capabilities impacting on dynamic capabilities, rather than the more general definition that they are capabilities 'of the "learning to learn" variety (Collis, 1994, p. 143).

In addition to hierarchical views of dynamic capabilities, Helfat with Maritan (2007) argue that it is beneficial to state the specific effect or modification of the resource base brought about by a dynamic capability. In essence, they are concerned with the "what" of the resource or capability change. Knowing what is being changed in the resource base can bring further understanding to the functioning of dynamic capabilities in an organization. Zollo and Winter (2002) also identify the task features or the components of the dynamic capability that indicates what exactly is being done, modified, created and impacted in the resource base.

Like the resource-based view in general, much of the literature on dynamic capabilities has been content-oriented and has been particularly concerned with their effects, especially enterprise performance (Helfat with Maritan, 2007). Indeed, there is much

debate as to whether a dynamic capability, by definition, must generate superior firm performance or that just a change in the resource base, whether or not it impacts market performance, is a sufficient condition for a dynamic capability to exist (Helfat et al, 2007; Easterby-Smith, Lyles and Peteraf, 2009). Teece, Pisano and Shuen (1997) argue for the necessity of a link between dynamic capabilities and competitive advantage or firm performance when they state, 'we refer to this ability to achieve new forms of competitive advantage as dynamic capabilities' (Teece, Pisano and Shuen, 1997, p. 515). Later, Teece (2007, 2009) maintains that dynamic capabilities are 'the foundation of enterprise-level competitive advantage in regimes of rapid (technological) change' (2007, p. 1341) and that dynamic capabilities are 'necessary to sustain superior enterprise performance' in a highly dynamic environment (2007, p. 1319).

In contrast to those who hold the view that dynamic capabilities must be seen in terms of their effect on firm performance, Eisenhardt and Martin (2000) argue that dynamic capabilities cannot be a source of competitive advantage or superior firm performance because they represent best practice and that firms may establish similar competitive advantages based on substantially different competencies. Teece (2007) takes an opposing view again and argues that while best practices will not lead to competitive advantage, they are unlikely to constitute dynamic capabilities. Zollo and Winter (2002, p. 340), in contrast argue only that dynamic capabilities are 'in pursuit of improved effectiveness'. Similarly, Helfat et al (2007) deliberately exclude any form of tautology between dynamic capability and firm performance or ability. As they write, "change in the resource base of an organization implies only that the organization is doing something different, but not necessarily better, than before." (Helfat et al, 2007: 5). Like Teece (2007), they also reject the view that dynamic capabilities are nothing more than best practice. They argue that the link between dynamic capabilities and competitive advantage is moderated by similar valuable, rare, inimitable and non-substitutability (VRIN) characteristics as identified by Peteraf and Barney (2003) in the resource-based view.

Summary

As Helfat et al (2007) state in their definition (see Table One), dynamic capabilities create, modify or extend the resource base which consists of tangible and intangible assets, operating capabilities and other dynamic capabilities. However, whether resource base changes must always lead to superior firm performance outcomes or simply provide *the opportunity* for improved outcomes remains a matter of debate. I shall return to this particular debate when I discuss the nature of the resource effects I am searching for and the boundary conditions I set for studying the influence of absorptive capacity on the origin and evolution of dynamic capabilities.

There is increasing support that there exists a hierarchy of dynamic capabilities in firms, depending on the nature and extent of their effect on the resource base, whether incremental or renewing of existing routines and resources or regenerative of other dynamic capabilities (as synthesised by Ambrosini, Bowman and Collier, 2009). In this research, I group these three levels of dynamic capability into two types (regenerative and incremental / renewal) and add them to the conceptual framework, shown in Figure Three below.

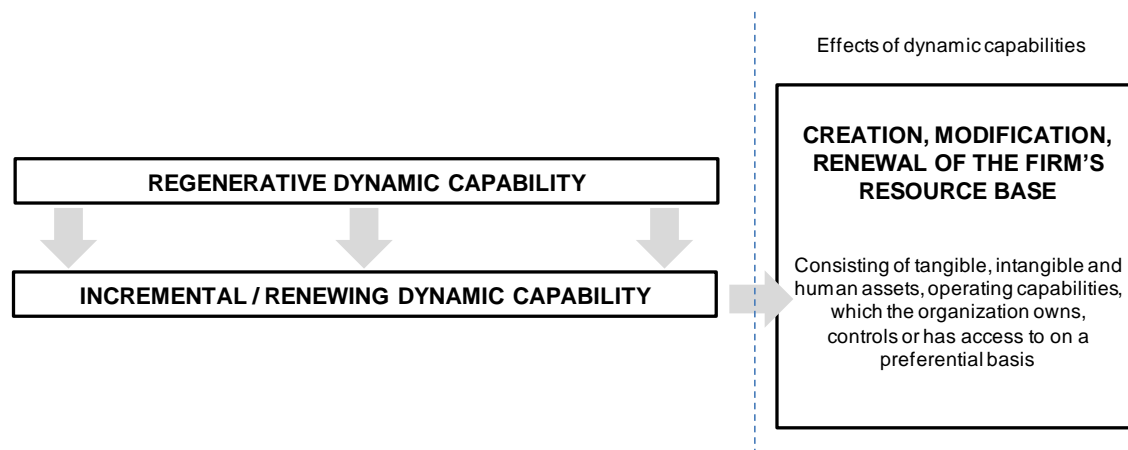


Figure Three – Regenerative and incremental / renewing dynamic capabilities and their effect on the firm's resource base: The second component of the conceptual framework

With a basis for understanding of the “effects” of dynamic capabilities on the resource base and firm performance, it is important next to determine how dynamic capabilities are brought about, i.e., how are they originated and built. Next, I review these perspectives.

2) Origin and intent: Understanding why and how dynamic capabilities originate in terms of the influence of the external environment and the nature or degree of managerial intent

The role of the external environment (e.g., the market, customers, competition, institutions, science / technology developments) on the origination of dynamic capabilities within firms is a topic of considerable debate in the literature. Broadly speaking, there are three perspectives, namely

- a. *Exogenous perspective* – Dynamic capabilities originate as a result of exogenous change in the market environment (e.g., as in Teece's [1997] original definition, they “address rapidly changing environments”)
- b. *Co-evolutionary perspective* – Dynamic capabilities arise through co-evolution of firms and their markets where firms may respond to external market stimuli (e.g., customer desires, competitor actions) or in collaboration with other firms. By capturing, articulating and codifying knowledge or events, yet that knowledge in-and-of-itself, does not make the firm necessarily more capable of creating and modifying its resource base (Zollo and Winter, 2002).
- c. *Endogenous perspective* - Dynamic capabilities can originate without the need for an external event. For example, Eisenhardt and Martin (2000) identified that dynamic capabilities may exist in environments where there is no significant rapid change. Zollo and Winter (2002) agree. They state that in many cases, it is clear that firms do not necessarily have to be exposed to rapidly changing environments for the existence of dynamic capabilities. Rather, they often seek to integrate, build and reconfigure their competencies in relatively stable environments too.

Given my interest in the role of external knowledge assimilation (absorptive capacity) on the origin of dynamic capabilities, an important aspect of the research will be to

examine the interplay of influence of the external environment with the learning mechanisms, experience accumulation, tacit knowledge and decisions of managers within the case-study firm.

Another factor related to the origination or development of a dynamic capability is the “why” or the intent that led to their development and continued evolution. The degree of intent is an important feature of dynamic capabilities according to Helfat et al (2007) which distinguishes them from organisational routines that lack intent, as well as from “accident or luck” (Dosi, Nelson and Winter, 2000). I include considerations of intent of dynamic capabilities in this research.

Having reviewed the literature on the origin and intent of dynamic capabilities, I now add these two components to my conceptual framework for this study which is shown in Figure Four below.

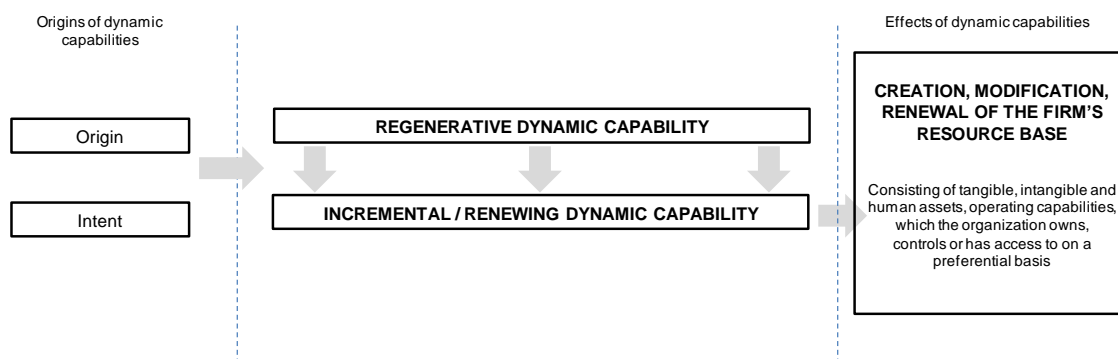


Figure Four – The origins of dynamic capabilities: The third component of the conceptual framework

3) *Constituents: Understanding what dynamic capabilities consist of*

Much of the literature on dynamic capabilities is concerned with debates about what they actually consist of. For example, Eisenhardt and Martin (2000) define dynamic capabilities as consisting of organisational processes such as product development routines, alliance and acquisition capabilities, resource allocation routines, and knowledge transfer and replication routines. Zollo and Winter (2002) more specifically emphasize “collective activities” rather than processes in their definition. Ambrosini and Bowman (2009) believe there is growing consensus that dynamic capabilities are essentially organisational processes in the most general sense. Helfat with Maritan (2007: 30) provide a clear statement about what dynamic capabilities consist of:

“Dynamic capabilities are about change. To identify the need or opportunity for change and to accomplish this change, the organization uses processes – search processes, decision-making processes, change management processes, and others. There is an inextricable link between dynamic capabilities and the organisational and managerial processes that underpin them. However, the relationship between process and dynamic capabilities is often left unstated or implied.”

Helfat with Maritan (2007) state that there are two ways in which organisational processes underpin the functioning of dynamic capabilities; processes as the mechanisms by which dynamic capabilities evolve or develop (*development*), and the

mechanisms by which organizations put dynamic capabilities into use (*deployment*). Next, I examine each in turn.

4) *Development: Understanding how dynamic capabilities develop and evolve*

There is consensus in the literature that the development of dynamic capabilities, both the origination of new ones and the improvement of existing ones, occurs through organisational learning processes (Zollo and Winter, 2002) and investment processes (Maritan, 2001). Building on Nelson and Winter's evolutionary view of the firm, Zollo and Winter (2002) identify that whilst the Teece et al. (1997) definition (see Table One) suggests something about what dynamic capabilities are for and how they work, it does not help us understand how they originate. Drawing on evolutionary economics (Nelson and Winter, 1982), their paper proposes a structure for the study of the formation (as well as evolution) of dynamic capabilities, which draws heavily on behavioural and cognitive traditions in organisational learning studies. They agree with the notion of 'higher order', learning-to-learn capabilities as described by Collis (1994) which they term "higher-order learning mechanisms". They also suggest that it is these higher-order learning mechanisms that lead to the evolution of dynamic capabilities and that by understanding them, firms will be better able to discover the means to identify causal linkages between learning mechanisms, capability development and performance outcomes. In other words, managers should know how to make potential rent-generating investments in learning (knowledge-creating) mechanisms that lead to the development or evolution of dynamic capabilities. They describe three inter-related learning mechanisms that underpin the evolution of dynamic capabilities, 1) tacit accumulation of past experiences, 2) knowledge articulation and 3) knowledge codification processes. Later, I return to an analysis of these three learning mechanisms as they are important constructs that can provide a link to absorptive capacity. I shall include learning mechanisms as one constituent of dynamic capabilities in my conceptual framework.

Teece (2007) takes a different view to that of Zollo and Winter (2002). Rather than emphasising the underlying learning mechanisms that originate and evolve dynamic capabilities, he identifies what he terms, the "microfoundations" of dynamic capabilities which strengthen them and which can lead to superior enterprise performance. He disaggregates dynamic capabilities into the capacity:

1. To sense and shape opportunities and threats
2. To seize opportunities
3. To maintain competitiveness through enhancing, combining, protecting, and when necessary, reconfiguring the business enterprise's intangible and tangible assets

In a review of the literature, Ambrosini and Bowman (2009), responding to Teece (2007), identify that dynamic capabilities constitute search activities, i.e. the identification of opportunities and threats, and the ability to sense changing customer needs, technological opportunities and competitive developments (Augier and Teece 2007; Teece 2007). They also make it clear that whilst there is no doubt that these are important elements in dynamic capabilities, these factors are not dynamic capabilities in and of themselves; rather, they are managerial and organisational processes that underpin and enable dynamic capabilities (Helfat with Maritan 2007).

Helfat and Eisenhardt (2004) also state that the identification of opportunities and threats comprises an important aspect of the search for new strategic opportunities, and that managers bear a critical responsibility for this. Generally speaking, the literature agrees that these “searching” or “sensing” processes are important for identifying the need or opportunity for change in the resource base or for the creation or renewal of dynamic capabilities. They are in essence *dynamic capability development processes* used to sense, filter, shape and calibrate opportunities to garner new technical information, tap developments in exogenous science, and monitor customer needs and competitor activity in order to determine the opportunity or identify the need to change the resource base of the firm and its existing dynamic capabilities (after Teece, 2009). Therefore, I shall use the concept of development processes in this research.

5) *Deployment of Dynamic Capabilities*

Another important aspect of discussion in the literature on dynamic capabilities concerns the nature of their deployment. For example, Zollo and Winter (2002) maintain that dynamic capabilities are learned, stable and systematic; that they are structured and persistent and are not disjointed responses to frequent crises or responses more characteristic of “ad hoc problem solving” (Winter, 2003). Helfat et al (2007) also state that dynamic capabilities must have some form of patterned or practiced activity and that it is important to distinguish them from a one-time idiosyncratic change to the resource base of an organization. Dynamic capabilities should be distinguished from innate talent that does not derive from the patterned experience of individuals involved in the decision-making or deployment of the capability.

When assets and capabilities come under the domain of management rather than the market, their effective deployment is essential (Helfat et al, 2007). Therefore, the role of management and managerial processes in orchestrating new or revised combinations and co-alignments of assets becomes central to the dynamic capabilities framework. Ambrosini, Bowman and Collier (2009) concur that it is vital that managers are placed at the centre of the discussion on dynamic capabilities. In their review of how firms renew their resource base, they consider managerial perceptions of environmental dynamism to be important, as managers base their decisions on these perceptions. Adner and Helfat (2003) introduce the term “dynamic managerial capabilities” to highlight the importance of managers’ strategic decision-making regarding the amount to invest in resources and how best to deploy those resources (Helfat et al., 2007). Simon and Hitt (2009: early print) expanded on this definition, stating that:

“Dynamic managerial capabilities focus on managers’ resource-related decisions. Asset orchestration, a central component of dynamic managerial capabilities and of resource management, highlights the importance of integrating (matching) resource investment and deployment decisions.”

As many intangible assets are idiosyncratic, they are more valuable when they are co-evolved with other assets. It is the manager’s task therefore to assemble unique configurations of co-specialized assets to improve firm performance. The role of “asset

orchestration” performed by managers is an essential component of any dynamic capabilities framework. In other words, asset orchestration concerns the managerial processes that are needed to orchestrate the resources necessary to deploy the dynamic capability and make the desired modifications to the resource base. Ambrosini, Bowman and Collier (2009) also considered these aspects of deployment and orchestration. They state that dynamic capabilities consist of four main processes: Reconfiguration, leveraging, learning and integration. As they state, (Ambrosini, Bowman and Collier, 2009: S11),

“Reconfiguration refers to the transformation and recombination of assets and resources ...Leveraging refers to the replication of a process or system that is operating in one area of a firm into another area, or extending a resource by deploying it into a new domainLearning allows tasks to be performed more effectively and efficiently, often as an outcome of experimentation, and permits reflection on failure and success. ...Integration refers to the ability of the firm to integrate and coordinate its assets and resources, resulting in the emergence of a new resource base.”

I use the above concepts of deployment processes in this research.

Summary: Characteristics of dynamic capabilities and final conceptual framework

As the above literature review suggests, many of the concepts in the dynamic capabilities framework are open to differing interpretations. These include: clarifying the components of the resource base, distinguishing types of dynamic capabilities, understanding how they are created and particularly, isolating the mechanisms and underlying organisational and managerial processes involved. In Table Two, I provide a summary of the main perspectives from the above literature review. I use the different characteristics of dynamic capabilities as the basis for consideration of the influence of absorptive capacity on their origin and evolution. In the conceptual framework shown in Figure Five, I link the different perspectives together in order to direct the empirical work.

Table Two – Summary Characteristics of Dynamic Capabilities

	Characteristic	Description
RESOURCE BASE EFFECTS	Resource base effects	The holistic view of the effect of dynamic capabilities states that they create, modify or renew the firm’s resource base in its widest sense, whether assets or capabilities or routines.
	Existing capability effects	The capability view of the effects of dynamic capabilities states that they reconfigure existing processes or operating capabilities and thus allow the organization to adapt and evolve.
	Hierarchy of dynamic capabilities according to resource base effects	Authors identify a hierarchy of dynamic capability types; typically with operating capabilities as the lowest form, dynamic capabilities which modify or renew the wider resource base as a second plus a third tier and those of a higher, meta- or learning-to-learn variety. I synthesise into two broad categories: 1. <i>Incremental / Renewing dynamic capability</i> Used to continually improve the resource base or adjust the mix of the extant resource stock. Renewing dynamic capabilities refresh and renew the resource stock

		<p>2. Regenerative dynamic capability</p> <p>Regenerative dynamic capabilities regenerate the current set of dynamic capabilities and would be used when managers perceive a threat or disruption to their business environment that risk making the current set of dynamic capabilities inappropriate. Regenerative dynamic capabilities are a form of meta-capabilities but are defined precisely as being dynamic capabilities impacting on dynamic capabilities.</p>
	Performance effect	Dynamic capabilities may or may not lead to an improvement in firm performance or competitive advantage; rather, they are “in the pursuit of improved effectiveness” and their ability to produce competitive advantage is moderated by Barney and Peteraf VRIN factors.
CONSTITUENTS	Development processes	They are path dependent and evolve through inter-related learning mechanisms of knowledge articulation, codification and experience accumulation along with investment deployment decisions which are reinforced and embedded through repetition
	Deployment processes	They are built from the patterned experience of individuals involved in the decision-making or deployment of the capability. Their effect on the resources base is a function of managerial investment and deployment decisions and their integration
ORIGIN AND INTENT	Role of external environment	Dynamic capabilities may originate as a result of external events or changes, as a result of endogenous change independent of external event or in co-evolution with markets and other firms.
	Intent	Dynamic capabilities are established through intentional rather than ad hoc opportunistic or idiosyncratic behaviour

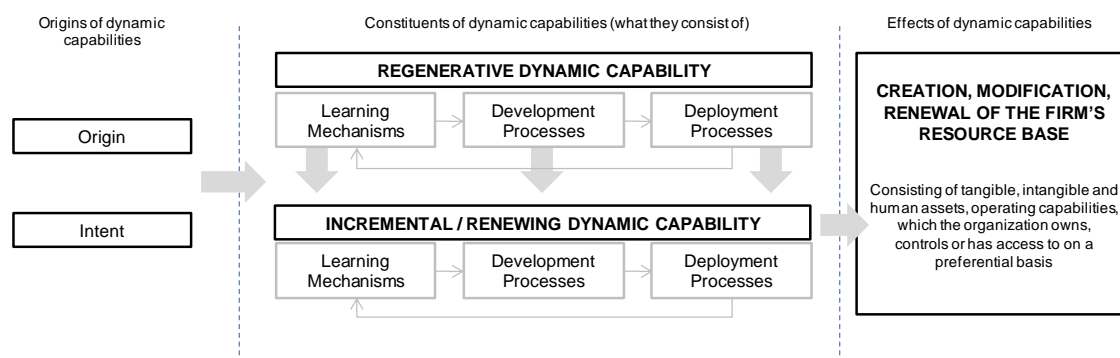


Figure Five – Final conceptual framework for the study of dynamic capabilities with constituents of dynamic capabilities added

Next, I review some of the weaknesses identified in the dynamic capabilities literature.

Weaknesses in the dynamic capabilities literature

The dynamic capabilities field has evolved considerably since Teece et al.'s first contribution in 1990. However, the literature identifies a number of weaknesses and therefore future directions to be addressed. Briefly, I summarise these.

“What” at the expense of process

As indicated above, most research on dynamic capabilities to date has been concerned with “what” questions; *what* defines them, *what* distinguishes them from other capabilities and *what* their effect is on firm-level outcomes (Helfat with Maritan, 2007). Whilst these are important, there has been little attention on the “how” of dynamic capabilities; that is, *how* do they originate, *how* are they developed, *how* are they deployed and *how* are resources reconfigured, co-aligned and integrated to achieve competitive advantage. This is a central concern of this research.

Integration with other related fields

There is a lack of integration of the dynamic capabilities framework with other complementary fields of enquiry, e.g. innovation, knowledge management, organisational change and development and organisational learning. Easterby-Smith and Prieto (2009) undertook one of the first attempts to integrate dynamic capabilities with knowledge management. They argue that there is a link between these two concepts and attempt to ascertain the conceptual connection between them as a basis for future research. They develop a framework that integrates the distinct roots of each field, identifies boundaries, and proposes relationships between the constructs and firm performance. They hope this will assist to examine links between other functional strategies and dynamic capabilities.

Managerial usefulness

Clearly, concept clarification and integration would help to establish dynamic capabilities as a managerially relevant framework (Ambrosini and Bowman, 2009). For example, knowing how dynamic capabilities are created would help to provide guidance for managers about how decisions and investments in dynamic capabilities can be made and what processes are necessary to create or renew their resource base. Presently, there are few studies that offer managerial prescriptions using the dynamic capabilities concept.

Methodological weaknesses

A significant criticism of the dynamic capabilities concept is that they are difficult to measure empirically, as are their underlying processes and their relationship with firm performance. It is also difficult to identify the routines and processes that are often idiosyncratic to firms or part of resource bundles (Penrose, 1959). Easterby-Smith, Lyles and Peteraf (2009) states that research must find ways to investigate processes of the creation and evolution of dynamic capabilities over time. This is again a central objective of this research.

Lack of empirical studies

Pablo et al. (2007, 690) emphasize that ‘while the dynamic capabilities framework is drawing support and increased validity by researchers, empirical studies of dynamic capabilities remain relatively rare’. Indeed, the early, influential papers, those by Teece et al. (1997) and Eisenhardt and Martin (2000) use only illustrative examples derived from data that were not collected purposively to understand dynamic capabilities.

Most papers since are also either conceptual or similarly derived from secondary data. They also mostly describe broad organisational processes; they do not delve into the detailed, micro mechanisms of how these capabilities are deployed or how they 'work'.

Ambrosini and Bowman (2009) offer several reasons for the lack of empirical studies:

1. Recency of the dynamic capabilities framework: the theoretical work did not start until the last 1990s.
2. Dynamic capabilities have been poorly specified.
3. The concept has proven largely resistant to observation and measurement.

They then recommend that qualitative, smaller sample studies are likely to be more appropriate for understanding the subtlety of resource creation and regeneration processes. To understand fully firm-specific resources, their context and how they were created or renewed in practice requires fine-grained investigations and to obtain rich and contextualized data qualitative fieldwork (Godfrey and Hill, 1995; Rouse and Daellenbach, 1999). In this research, I shall attempt to address this particular area of weakness in the dynamic capabilities literature.

Next, I review the literature on absorptive capacity.

Literature Set 3: The construct of absorptive capacity

Schumpeter (1934) places external sources of information on a par with internal information as an important driver of innovation and growth in his theory of economic development. However, it was not until many years later that researchers began to examine the role of knowledge in innovation as a distinct construct, by building upon Schumpeter's argument that internal knowledge on its own is insufficient and that by emphasising that acquiring information from all available sources is key to successful innovation. In three papers, Cohen and Levinthal (1989, 1990, 1994) have been most influential with their suggestion that the ability of a firm to recognize the value of new, external information, assimilate it and apply it to commercial ends is critical to innovation. They label this capability a firm's *absorptive capacity* and suggested that it is largely a function of the firm's level of prior related knowledge. They also argue that the development of absorptive capacity within firms is path- and history-dependent and that innovative performance is influenced by the level of existing knowledge, which in turn drives organisational absorptive capacity (Lane et al., 2002:3).

With an emphasis on the role of R&D, Cohen and Levinthal (1990) argue that through deliberate investments in R&D, firms develop their knowledge base as an outcome of ongoing scientific and technological research. This knowledge base in turn allows the firm to develop a capability for recognising, valuing and assimilating new external knowledge (*absorptive capacity*) that is related to its existing knowledge base. This knowledge base then allows the firm to achieve better innovation performance outcomes, not only via an ability to imitate other firms' products or processes but also through an ability to exploit less commercially focused knowledge such as basic scientific research. It also increases the skills of the employees who have been involved in the R&D process. These stocks of skills or of prior knowledge determine the ability to assimilate and utilise external knowledge. Over time, the firm develops

processes, policies, and procedures that facilitate sharing that knowledge internally. The firm also becomes skilled at using that knowledge to forecast technological trends, to create products and markets, and to manoeuvre strategically. While absorptive capacity is one of a firm's fundamental learning capabilities, a firm can invest in developing absorptive capacity only in relatively few areas owing to resource and cognitive limitations. The extent to which it invests in absorptive capacity ("invests in R&D," in the context of the early Cohen and Levinthal papers) for a given area is a function of the relevance of that area to the firm's strategy, the ease with which it can be learned and protected and the anticipated payoffs from using the knowledge commercially.

The emergence of the absorptive capacity construct coincided with the development of the resource-based view (RBV) and to a lesser extent its extension, the knowledge-based view of the firm. Given that organisational knowledge is an important asset in the resource base view of the firm, there are clear linkages to the dynamic capabilities framework on how firms create, modify or extend their resource base. Such linkages can be traced back to Cohen and Levinthal (1990) who themselves called absorptive capacity a "capability". Theoretically, Easterby-Smith et al (2008) argue that absorptive capacity is located between the fields of dynamic capability (Teece et al., 1997; Zollo and Winter, 2002), organisational learning (Akgun et al., 2003; Easterby-Smith, 1997) and knowledge management (Chiva and Allegre, 2005; Oshri et al., 2006). This is because on the one hand, it draws attention to the need to appreciate and acquire knowledge from the external environment, especially from acquisitions and other inter-organisational relations; on the other hand, it focuses on internal processes of learning from past experience and current actions.

The construct of absorptive capacity promises to explain how firms learn, develop, and assimilate new knowledge necessary for competitive advantage. It offers the emerging resource-based view (RBV) of the firm at least one set of firm capabilities that could potentially explain differences in competitive advantage (Lane et al, 2006). Indeed, in the two decades since Cohen and Levinthal first introduced the construct, absorptive capacity has been integrated into several research streams including strategic management, organisational learning, knowledge management and innovation management. It has been widely applied in empirical investigations that have, for example, examined research productivity in the pharmaceutical industry (Cockburn and Henderson, 1998), information technology use (Boynton et al., 1994), strategic alliances (Koza and Lewin, 1998) and organisational learning (Shenkar and Li, 1999).

Absorptive capacity processes and dynamic capabilities

More recent studies of absorptive capacity have begun to adopt a process perspective of the construct. Notably, Zahra and George (2002) reviewed the literature and were the first to explicitly conceptualize absorptive capacity as a dynamic capability. This conceptualization, they argue, enables them to provide a new model of the components, antecedents, contingencies, and outcomes of absorptive capacity (shown in Figure Six).

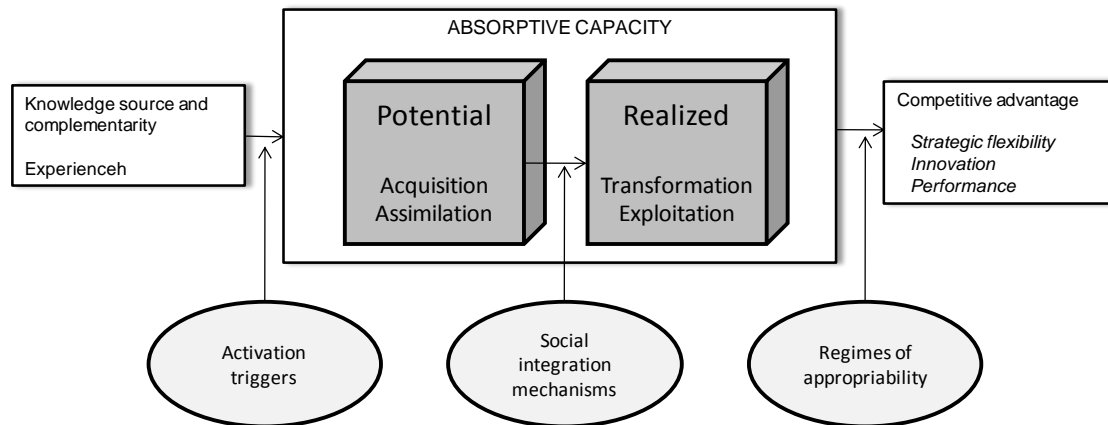


Figure Six: The Zahra and George (2002) model of absorptive capacity

The Zahra and George (2002) model develops a process view of absorptive capacity and adds two main refinements to the original concept proposed by Cohen and Levinthal (1989, 1990). First, they distinguish between *potential* absorptive capacity (or what they term PACAP), which includes the first two capabilities of acquisition and assimilation capabilities, and *realized* absorptive capacity (or RACAP), which includes transformation and exploitation capabilities. Second, they specify and elaborate on the internal processes, such as activation triggers and social integration mechanisms which aid the movement of knowledge within the firm. Activation triggers may include both internal crises and external market changes; and social integration mechanisms can include social structures that promote greater employee interaction and knowledge management systems. I shall refer to these mechanisms later in the research.

Furthermore, Zahra and George (2002:186) extend the most commonly used definition of Cohen and Levinthal (1990), defining absorptive capacity as “a set of organisational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organisational capability ... pertaining to knowledge creation and utilization, which enhances a firm’s ability to gain and sustain a competitive advantage”. It is interesting to note that Zahra and George (2002) are explicit in their definition that absorptive capacity may *produce dynamic capabilities*. Indeed, they continue by suggesting that the four capabilities – acquisition, assimilation, transformation and exploitation - are “combinative in nature and build upon each other to produce a dynamic organisational capability” (Zahra and George, 2002: 187). By defining absorptive capacity as capable of producing dynamic capabilities they also emphasized the strategic nature of the construct:

“... the four organisational capabilities of knowledge acquisition, assimilation, transformation and exploitation build on each other to yield ACAP – a dynamic capability that influences the firm’s ability to create and deploy the knowledge necessary to build other organisational capabilities (e.g., marketing, distribution and production). These diverse capabilities give the firm a foundation on which to achieve a competitive advantage that yields superior performance” (Zahra and George, 2002: 187)

Later, Newey and Zahra (2009) class the four organisational capabilities as *operating routines*. I shall use Zahra and George's (2002) definition and conceptualisation of absorptive capacity to guide the research design and particularly the examination of the processes or constituents of the dynamic capability being researched.

Despite the potential of the absorptive capacity construct to explain a wide range of innovation-related outcomes, Lane et al (2006) suggest that the absorptive capacity construct has become taken-for-granted or reified and that there is little cohesion in the community of researchers studying the phenomena. In their comprehensive review of the absorptive capacity literature, they identify a non-cumulative, diverse and unconnected research stream, despite a fairly narrow context. Next, I describe the shortcomings in the absorptive capacity literature as identified in Lane et al (2006) and other recent reviews.

Weaknesses in the absorptive capacity literature

R&D bias

The literature on absorptive capacity is dominated by analysis of how firms recognize the value of new technical or scientific knowledge, assimilate it and then apply it to commercial ends. As described above, Cohen and Levinthal (1990) operationalized absorptive capacity in respect of R&D investments, and in much of the subsequent literature, researchers who study the possibilities for increasing organisational absorptive capacity maintain this emphasis on R&D (see Escribano et al., 2005; Mancusi, 2004; Grünfeld, 2004; Kneller and Stevens, 2002; Knudsen et al., 2001; Griffith et al., 2000; Rocha, 1999). However, not all of the empirical research has supported this assumption. Results show that R&D is not equally significant in all the different circumstances and for all kinds of knowledge (Grünfeld, 2004; Schmidt, 2005). Lane et al (2001) highlight how a focus on R&D has led to a bias in the literature towards scientific / technical knowledge at the expense of a focus on other types of business-related knowledge (see Lane et al., 2006). Equally, there are few studies that examine how absorptive capacity is developed when innovation is taken out of R&D and placed into other functional areas of the firms, particularly marketing. This latter shortcoming is a central concern of this research.

Knowledge content bias

In the view of Lane et al. (2006), the R&D focus in the absorptive capacity literature to date has provided a technological content knowledge emphasis at the expense of process-oriented knowledge such as managerial techniques, marketing knowledge and manufacturing know-how. In addition, a focus on the content of a firm's prior knowledge (with a scientific / technological bias) has led to an overemphasis on tangible outcomes of absorptive capacity, such as inventions and innovations, at the expense of less concrete outputs, such as the process knowledge which can be of greater importance to the firm over the long run. In short, possessing relevant prior knowledge is seen as a necessary but not sufficient condition for a firm to have absorptive capacity. This is surprising because Cohen and Levinthal's (1990) view of the construct clearly encompasses the need to understand the dynamics within the

organization that lead to the ability to recognize, assimilate and utilize useful external knowledge (the second two dimensions are clearly process-oriented).

While in many papers researchers have discussed absorptive capacity as a process or capability, very few have attempted to operationalize it as such (Lane and Lubatkin, 1998; Lane et al., 2006). This perhaps reflects the lack of conceptual frameworks for the study of capabilities, their origin, evolution and effects. Easterby-Smith et al (2008) suggest that more work needs to be done to understand the inner processes of absorptive capacity. Focusing on knowledge content at the expense of knowledge processes also has contributed to the relative absence of normative models for the management of absorptive capacity (Lane et al, 2006). Future research needs to develop actionable recommendations concerning the processes and policies that firms may use to develop and manage absorptive capacity in R&D and non-R&D contexts.

Eschewing the narrow focus on knowledge content, some authors have developed alternative measures that seek to capture a capability or process view of absorptive capacity that includes in addition to knowledge content, organisational routines and processes. Proxies such as age (Rao and Drazin, 2002; Sorenson and Stuart, 2000) and size (Mowery et al., 1996) have been used to argue that older/ larger firms have high absorptive capacity because they are likely to have accumulated knowledge and developed routines and processes that facilitate assimilation and innovation. However, the evidence has been less conclusive (e.g., see Mowery et al., 1996), indicating, perhaps, the need to more directly operationalize absorptive capacity as a capability. In a limited set of studies (Lane and Lubatkin, 1998; Lane, Salk and Lyles, 2001; Meeus et al., 2001; Szulanski, 1996), researchers have done this by operationalizing absorptive capacity as compensation policies, dominant logic, knowledge-sharing routines, motivation, and competencies. In particular, Lane and Lubatkin (1998) find that such factors explain more variance than R&D investment, which points both to the importance of these factors and to the limitations of proxies for knowledge content in accurately capturing the level of absorptive capacity in an organization.

Lane et al (2006) suggest the need to move away from a structural perspective of absorptive capacity to a view of it as more of a dynamic capability. Such a shift in perspective focuses attention on the structure, policies and processes within the organization that affect knowledge creation, transfer, sharing and integration. These, in turn, influence the efficiency and the effectiveness of the firm's absorptive capacity. They conclude,

“future studies should view absorptive capacity as a capability rather than a “thing” that is divorced of its context” (Lane et al, 2006: 858)

Easterby-Smith et al (2008: 485) state that the knowledge content bias arises from a quantitative bias in the empirical research conducted into absorptive capacity,

“It is ... possible that the lack of development of the concept of absorptive capacity results from the dominant use of research methods which are more appropriate for testing, rather than developing, theory. If so, then new ideas and perspectives are far more likely to be added if qualitative methods are used to examine absorptive capacity.”

Lane et al (2006) concur and suggest that researchers deploy qualitative methods to address the current problems of tautological measures and to better explore the process aspects of absorptive capacity.

Operationalization of absorptive capacity

Despite the popularity and longevity of the absorptive capacity construct, its empirical study has remained problematic for several reasons, not least the ambiguity and diversity of multiple definitions, varying perspectives on its components, and inconsistencies in identifying antecedents and outcomes (Zahra and George, 2002). This is because study to date has been largely at a conceptual level with most contributions only building on secondary data and literature reviews (Easterby-Smith et al, 2005). There are very few empirical studies that address the concept using new primary data. Thus authors argue for greater clarity and operationalization of absorptive capacity as an organisational research construct.

Finally, I now review briefly the literature on market learning.

Literature Set 4: Market learning literature

The fourth and final set of literature is market-learning which is valuable to a firm because it focuses on understanding and effectively satisfying customers expressed and latent needs through new products, services and ways of doing business (Day, 1994b; Sinkula, 1994). Slater and Narver (1995) suggest that market-learning should lead directly to superior outcomes such as greater new product success, superior customer retention, higher customer defined quality, and ultimately, superior growth and/or profitability.

In their empirical study of market orientation and the learning organization, Slater and Narver (1995) suggest that effective firms are “configurations of management practices that facilitate the development of knowledge that can become the basis for competitive advantage”. They argue that the critical challenge for any business is to create the combination of culture and climate that maximises organisational learning concerning how to create superior customer value in dynamic and turbulent markets. Though a market orientation provides strong norms for learning from customers and competitors, it must be complemented by entrepreneurship and appropriate organisational structures and processes for generative learning to occur.

Slater and Narver (1995) describe the processes or behaviours through which organizations develop and use new knowledge to improve performance. Later, Slater, Narver and Tietje (1998) describe how firms can create a market orientation. They suggest that continuous learning is the key to developing a market orientation and that, “the first necessary learning is gaining an organization-wide commitment to the continuous creation of superior value for customers. The second necessary learning is creating an understanding of how to implement this norm.” (p.252)

Sinkula (1994) also characterises the relationship between organisational learning and market information processing. He suggested that the marketing literature had been overly concerned with information use at the expense of learning processes. He deploys an information processing perspective on learning to develop a hierarchy of market knowledge that uses an evolutionary perspective linked to organisational age.

He suggests that the extent to which a firm uses market information is a function of what it has already learned (akin to Nelson and Winter's [1982] evolutionary model of the firm). As part of this evolutionary process, an organisational system of norms for behaving is developed. This is consistent with the definition of market orientation espoused by Slater and Narver (1995).

Sinkula (1994) also explores some of the antecedents to effective market-learning. Central to the organization's "learning orientation" is the fundamental value it places on learning. This determines how likely the organization will be to encourage a learning culture (Hult, 1998; Hult and Ferrell, 1997a; 1997b; Hult and Nichols, 1996; Sinkula et al., 1997), provide leadership to support such a learning culture (Hult et al., 1998), support innovativeness in the firm's culture (Hurley and Hult, 1998), and adopt an overall quality focus (Parkinson and Chambers, 1998). Later, Sinkula, Baker and Noordewier (1997) empirically test a value-based construct of "learning orientation". They examine the factors that breed a desire to learn (i.e. organisational values) versus information-related behaviours that facilitate learning (i.e. market information processing). They conclude that a more positive learning orientation will directly result in increased market information generation and dissemination (a knowledge-based construct) which, in turn, directly affects the degree to which an organization makes changes in its marketing strategies (a behavioural construct).

Throughout Day's influential research agenda (1990, 1994a, 1994b, 2002), he adopts an information-processing perspective with a sense-making dimension, arguing that organizations continuously learn about their markets through the linked processes of market sensing and sense making. Firms that have mastered these two processes gain an advantage by anticipating market opportunities ahead of their rivals and more accurately forecasting how the market will respond to their moves. Continuous market sensing, Day (2002) suggests, consists of many "devices" that help a firm open "its collective mind". Before organizations can use the information they have collected, Day (2002) argues that they "must classify, sort and simplify it into coherent patterns" (p. 247). This requires the development of mutually informed mental models throughout the organization which can keep the organization moving in a common direction. Critically, unless there is a "collective memory" – in the form of a shared knowledge base – all these insights will be lost. Therefore, Day (2002) recommends the development of knowledge bases as one of the firm's most valuable assets. There appears to be a strong link between Day's notion of sensing and gathering market opportunities and Teece's (2007) explication of the micro-foundations of dynamic capabilities. This link provides the justification for research into the acquisition and assimilation of customer needs in this study.

Weaknesses in the market learning literature

Limited empirical work on market-learning capabilities

The importance to a firm's competitive advantage of the capabilities that generate and integrate market knowledge has been acknowledged conceptually (Day and Wensley, 1988; Glazer, 1991; Hunt and Morgan, 1995) in the academic literature. However, with the exceptions of Li and Calantone (1998), Campbell (2003) and Weerawardena (2003), there has been little empirical work on market-learning capabilities to date.

Also, the literature does not develop an integrated conceptual view of capabilities for market learning from different research strands such as strategy, marketing management, customer relationship management, market-learning, innovation management and the organisational learning literature. Various authors have pointed to the need for a single, unified and comprehensive view of customer needs across all business functions, points of interaction and audiences (Shoemaker, 2001; Wiig, 1999).

In the next section, I specify the research design I have pursued to address the shortcomings in the literature described above, as well as my research question and objectives.

SECTION THREE: RESEARCH QUESTION, METHOD AND DESIGN

In this section, I establish the linkages between the shortcomings cited in the literature review, my philosophical perspective, the nature of the research question and the chosen methodology. First I discuss the nature of the research question.

The nature of the research question

Blaikie (1993) advises researchers to consider the nature of their research question along the following six criteria for distinguishing research philosophy, approaches and strategies: These are:

1. The ontological and epistemological assumptions adopted
2. The purpose of the social enquiry
3. The processes of theory construction and theory testing
4. The relationships between lay concepts and social science discourse
5. The relationship of the researcher to the research
6. The meaning and relevance of the notions of objectivity and truth

Each of the criteria is discussed in respect of my individual perspective, the literature review above and my research question which is:

**How does absorptive capacity influence
the origin and evolution of dynamic capabilities?**

The ontological and epistemological assumptions adopted

My ontological and epistemological assumptions are closely aligned with critical realism and are derived from considerations of the observability of reality within a) the context of the research phenomena of interest and b) my personal belief system.

Critical realism argues that whilst reality exists independent of our representation of it, observation of reality is value-laden and is a result of social conditioning (Bhaskar, 1978). It suggests that reality cannot be understood without consideration of the social actors involved in the knowledge derivation process. Critical realism also argues that although our perceptions of reality are constantly changing, the underlying structures and mechanisms that constitute reality are relatively enduring (Sayer, 1992). One aim of critical realism research therefore is to develop an improved understanding of the structures and mechanisms that form reality.

Contextually, my combined ontological and epistemological perspective can be illustrated with reference to the observability of dynamic capabilities, their constituents and their relationship to the external market. For example, although firm outcomes (e.g. products, communications and brands) might be directly observable, dynamic capabilities and firm resources are often not, being deeply embedded in tacit assumptions, shared experience, mental models, processes and systems. Nevertheless, certain firms do have capabilities that create, modify or renew their resource base - capabilities that must therefore exist even if they are not directly observable.

I therefore believe that critical realism provides a useful bridge between the dualism of outright representationalist and constructivist ontological perspectives. I now explain my reasons in more detail.

Discounting outright representationalism

I believe that a positivist view is less appropriate when researching dynamic capabilities. This is because their study must be concerned with manager's tacitly-held assumptions, mental models, experiences and behaviour, and also their ability to reflect on problem situations and to act according to justified true beliefs and organisational intentions (Nonaka and Takeuchi, 1995). If I were to adopt an outright representationalist ontological perspective, then the study of dynamic capabilities can be problematic owing to the difficulty of identifying, measuring and analysing "facts" made up of discrete elements and causal relationships (Guba and Lincoln, 1994; Tsoukas, 1989).

Of particular interest to me is the way that the positivistic view of reality is exemplified in the dominant information processing perspective of market learning. Malhotra (2000) suggests that the notion of knowledge contained within this paradigm is somewhat static and "syntactic". Adopting this view of knowledge can serve to disregard how people in organisations actually go about acquiring, sharing and creating new knowledge.

Discounting outright constructivism

Polanyi (1967) was the first to draw the distinction between tacit and explicit knowledge. Malhotra (2000) and many authors since (Brown and Duguid, 1991; Elkjaer, 2003; Goldman, 1999; Weick, 1979; von Krogh and Roos, 1996; Weick and Roberts, 1993) now implicitly recognise that knowledge resides in individuals and not in a collection or system of information. They argue that it is how an individual interprets and responds to such information that matters. I agree yet still discount an outright constructivist ontological perspective on the basis that reality is not purely socially constructed. Rather, as critical realism defines, there still exists a reality that is independent of the knower. Perception alone is not reality as constructivists would suggest; instead perception can be seen as a window onto reality from which a picture of reality can be triangulated with other perceptions. Also, and more generally, constructivist epistemology can exclude concerns about the clearly real and technological dimensions of business and markets (Hunt, 1991).

The attraction of critical realism

Critical realism is therefore attractive to me because it makes a "conscious compromise between positivism and social constructionism: it recognises social conditions as having real consequences whether or not they are observed and labelled by social scientists; but it also recognises that concepts are human constructions." (Easterby-Smith et al., 2002: 33).

Critical realism also appeals because it makes a distinction between external or contingent relations and internal or necessary relations among objects or bodies (Easton, 2002). Within the marketing realm, the importance of contingencies can be

illustrated with respect to the relationship between customers (an external entity) and the organisation (with internal relations), both of which have an independent existence yet can still influence one another. Equally, customers also have necessary relations and social structures in line with the hierarchical structure of reality that critical realism espouses. For example, customers can be individuals, segments and online communities. As Easton (2002) describes, a critical realism approach to contingency relations focuses on “the nature of the phenomenon that a researcher wishes to study couched in terms of the necessary relations between the entities involved ... and the mechanisms by which the entities operate on the necessary relationships” (p.107).

The purpose of the enquiry

There are three purposes to this research:

1. *To advance understanding of the nature, origin and evolution of dynamic capabilities* The research will seek to elaborate on existing theories by building from the literature and then testing a conceptual framework for the study of dynamic capabilities
2. *To advance understanding of the relationship between absorptive capacity and the origin and evolution of dynamic capabilities* The research will seek to determine how the mechanisms used to acquire external knowledge and the factors governing firm’s ability to assimilate the new knowledge influence the origin and evolution of new and existing dynamic capabilities.
3. *To identify whether under certain conditions absorptive capacity can be itself defined as a dynamic capability* Finally, I attempt to clear up some of the confusion in the literature concerning whether absorptive capacity itself can be classed as a dynamic capability.

The processes of theory construction and theory testing

One substantive theoretical lens has been applied in the research. This is the dynamic capabilities framework derived from the resource-based view (RBV) of the firm.

I will use this perspective to research the underlying mechanisms of dynamic capabilities for absorptive capacity of knowledge of customer needs. I will aim to both elaborate and develop dynamic capabilities to inform a more reliable and more robust development of practice (Eden and Huxham, 2002) as well as achieve a contribution to knowledge. I reject outright inductive or deductive theory testing or building strategies but instead expect the research to link with and elaborate the work of others. However, as described in the literature review, the theoretical base for dynamic capabilities is weak and the environment under study confused.

This approach fits with Easterby-Smith and Araujo’s (1999) call for studies which develop theory from practice and which use a small sample of in-depth cases, which focus on micro-practices within organisational settings and which study processes and competencies leading to learning outcomes.

The relationships between lay concepts and social science discourse

I believe that the production of knowledge is largely a social practice and that the social relations of knowledge production, particularly language and discourse, can influence its content. As Easton (2002: 105) describes, “the nature of language and the way we communicate are not merely incidental to what is known and communicated. This contrasts with the positivist rejection of the role of language in description or explanation. Therefore, I will place great importance on practitioner language and its relationship with the origin and evolution of dynamic capabilities.

In my experience, the RBV language is inconsistent, confused and complex. In order to explain and understand the phenomena of interest, I must therefore evaluate the language critically. Bhaskar (1978) acknowledges that there is more knowledge than in the lay language and hence critique is possible (Blaikie, 1993).

The relationship of the researcher to the researched

My preferred status is to be a detached and neutral observer. This fits with my continuing commercial interests and orientation. I have been engaged with the case-study firm as an advisor yet not a participant in their change programme for the past two years.

The meaning and relevance of the notions of objectivity and truth

I do not support the view of an absolute, static or non-human truth, of a world made up of facts independent of the observer. Rather, I concur with the assertion that knowledge is a “dynamic process of justifying personal belief toward the truth” (Nonaka and Takeuchi, 1995: 58) and that knowledge is anchored in the personal beliefs and commitment of its holder.

Having addressed, Blaikie’s (1993) criteria for selecting a research question, I now summarise my chosen research method and its design

Research method and design

On the basis of the above analysis, I shall use a *qualitative case-study method* to identify the dynamics and mechanisms of absorptive capacity and their influence on the origin and evolution of dynamic capabilities within a single case setting. I do not wish to generate theory but rather seek to provide a description. To do so, I shall employ a strategy-as-practice lens (Jarzabkowski, 2005). The strategy-as-practice perspective is concerned with what people do. Through interviews and recording of the processes undertaken by individuals and teams, my goal is to obtain evidence of what dynamic capabilities look like in the case-study firm, how they originated and how they have been developed and deployed. I also wish to understand the learning mechanisms and triggers that contributed to their evolution.

Using a shortened version of Eisenhardt’s (1989) road map for undertaking case-study research, next I summarise the different phases deployed in the research.

Getting started: the research question and boundary-setting

First, I defined my research question and selected the theoretical foundations for the study. These, as stated above, are RBV with the dynamic capabilities perspective integrated with the construct of absorptive capacity. Second, I needed to set some boundaries to guide the research intervention. There are three boundary conditions which, together with the underlying rationale for their selection, are as follows:

Potential absorptive capacity

As I discussed in the literature review section on dynamic capabilities, Helfat et al (2007) deliberately exclude any form of tautology between dynamic capability and firm performance or ability. As they write, “change in the resource base of an organization implies only that the organization is doing something different, but not necessarily better, than before.” (Helfat et al, 2007: 5). Zollo and Winter (2002, p. 340), argue similarly that dynamic capabilities are ‘in pursuit of improved effectiveness’ and may not necessarily deliver competitive advantage. In essence, these authors state that a dynamic capability has the *potential for improved performance* but may not necessarily always realise such potential.

In the absorptive capacity literature, Zahra and George (2002) pursue a similar theme, which I discussed in this section. They separate the potential from the realised effects of external knowledge on firm performance. They state that by developing absorptive capacity a firm only may enhance its ability to gain and sustain a competitive advantage. In other words, absorptive capacity only provides the firm with a foundation on which to achieve a competitive advantage that yields superior performance (Zahra and George, 2002).

Given these particular perspectives on the *potential* effects of dynamic capabilities and absorptive capacity, I have deliberately bounded the study to examine change in the resource base alone rather than firm performance outcomes. As Helfat et al (2007) suggest, such change may take the form of new or modified dynamic capabilities, operating capabilities or knowledge resources. In other words, I did not wish to discover firm performance effects in the form of superior innovation outcomes, new product launches, market share gains and so on. Undoubtedly, a study that includes market or other outcomes would be ideal, but given the calls in the literature for more in-depth studies of the processes of absorptive capacity, I wish to narrow my lens to examine these aspects of the changes alone that took place within the case-study firm.

Therefore, I made a selection of just the first two capability construct dimensions of *potential absorptive capacity* (or PACAP), as defined in the Zahra and George (2002) model and shown in Figure Six (see page 37). These two constructs are the *acquisition* and the *assimilation* of external knowledge. By selecting these dimensions of absorptive capacity only, I avoid the need to study the *transformation and exploitation* of new knowledge within the firm (the third and fourth constructs in the Zahra and George [2002] model) and the performance outcomes that were or were not achieved.

Sensing and seizing opportunities

Second, having limited the study to potential absorptive capacity and its effect on the origin and evolution of dynamic capabilities, next I needed to locate then set

boundaries around activities or processes within the firm where it acquires and assimilates external knowledge *before* its transformation and exploitation.

In his most recent paper on dynamic capabilities, Teece (2007) attempts to specify the nature and microfoundations of the dynamic capabilities necessary to sustain superior enterprise performance. In it, he presents a set of important microfoundations that define how firms sense and seize market and technological opportunities, stating that the discovery of opportunities can be grounded in organizational processes. Of particular note, two passages in his paper were influential in bounding my research. The first describes organisational processes that resemble the acquisition construct and the second, the assimilation construct, in potential absorptive capacity. I reproduce them here:

“Organizational processes can be put into place to garner new technical information, tap developments in exogenous science, monitor customer needs and competitor activity, and shape new products and processes opportunities.” (Teece, 2007: 1323)

“Information must be filtered, and must flow to those capable of making sense of it. Internal argument and discussion about changing market and technological reality can be both inductive and deductive. Hypothesis development, hypothesis “testing” and synthesis about the meaning of information obtained via search are critical functions. The rigorous assembly of data, facts and anecdotes can help test beliefs. Once a synthesis of the evidence is achieved, recurrent synthesis and updating can be embedded in business processes designed by middle management. If enterprises fail to engage in such activities, they won’t be able to assess market and technological developments and spot opportunities. As a consequence, they will likely miss opportunities visible to others.” (Teece, 2007: 1323)

Teece (2007) concludes that firms must develop an “ecosystem” consisting of “analytical systems (and individual capacities) to learn and to sense, filter, shape, and calibrate opportunities”. I reproduce the Teece (2007) ecosystem framework in Figure Seven below:

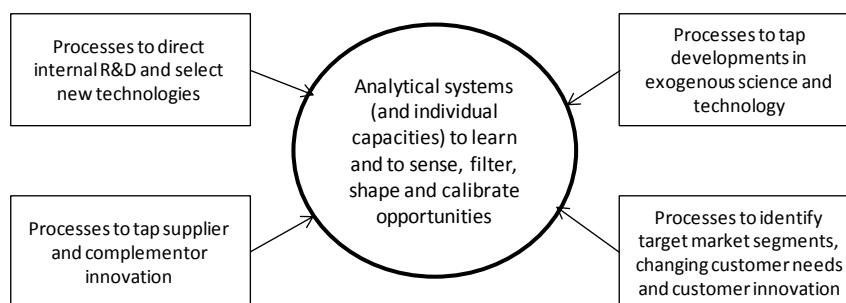


Figure Seven – Elements of an ecosystem framework for ‘sensing’ market and technological opportunities (Teece, 2007)

Processes to identify target market segments and changing customer needs

As Figure Seven depicts, Teece (2007) argues that an “ecosystem” for sensing market and technological opportunities must consist of four elements, namely

1. Processes to direct internal R&D and select new technologies.
2. Processes to tap supplier and complementor innovation.
3. Processes to tap developments in exogenous science and technology.
4. Processes to identify target market segments, changing customer needs, and customer innovation.

My third bounding condition for the research is to select one of these elements, namely only those processes for identifying target market segments and changing customer needs. By doing so, I wish only to understand how the acquisition and assimilation of such knowledge may influence the origin and evolution of existing and/or new dynamic capabilities, operating capabilities and modifications in the firm's resource base. This fits with the emphasis in the market-learning literature on the importance of such knowledge.

Next, I explain how I selected my case firm that could meet the above boundary-setting criteria.

Selecting a case

On the basis of the three boundary-setting criteria described above, the next phase of my research was to find a firm that had:

- Made a deliberate attempt to acquire and assimilate new external knowledge for innovation by shifting the focus of its knowledge inputs from technological and scientific knowledge to knowledge of customer needs and segments. In other words, I needed to find a firm that wished to develop a market orientation.
- Developed and deployed multi-functional managerial and organisational processes for the purposeful acquisition and assimilation of knowledge of customer needs for the sensing and seizing of market opportunities, i.e., it was not an idiosyncratic, ad hoc effort. Such processes must have been originated some time ago and were already embedded and patterned within the firm to allow to them be identified and tracked.
- Built these processes within the firm rather than acquired them from the market or at least had begun to embed them after acquiring them externally.
- Made a decision to acquire and assimilate new knowledge in a relatively stable environment, further highlighting the purposeful intent behind the origin of dynamic capabilities.
- Managers available for interview who were involved in both the purposeful decision to modify the firm's knowledge base and those who were involved in the development and deployment of the change itself.

On the basis of the above criteria, a Danish medical consumer and health care practitioner products company was selected as the single case for the study. The firm – which I shall call *Medical One* - has been established for 50 years and had recently made a deliberate decision to develop new processes for acquiring and assimilating new external knowledge of customer needs for the discovery of market opportunities. Before describing the research instruments and protocols, first I provide some background and facts on *Medical One*.

Key facts about Medical One

Medical One is a Danish company that manufactures and sells products which help people to live a normal life with intimate conditions. It operates in three core markets, namely:

- Ostomy Care: Products for people whose intestinal outlet has been rerouted through the abdominal wall
- Urology and Continence Care: Products for people suffering from diseases of the kidneys, the urinary system and the male reproductive system
- Wound Care: Dressings for the treatment of chronic wounds and skin care products for prevention and treatment.

A selection of *Medical One* products is shown in Figure Eight below.



Figure Eight – A selection of *Medical One* products

Based in the Copenhagen region, the firm employs approximately 4,000 people in Denmark with subsidiary companies in over 30 countries. Its manufacturing facilities are located in Denmark, Hungary, China, USA and France. The company was founded in 1957 and was listed on the Copenhagen Stock Exchange in 1983. It is now the world's leading supplier of intimate healthcare products and services and in 2007/08 total revenues were £850m approximately.

Twenty-four months ago, *Medical One* adopted a new mission statement that emphasised a new culture and purpose embodied in the phrase, “closeness to all customers”. They set out on a deliberate programme to better understand customers and their needs, and find new ways to develop products and services in collaboration with them. The assumption driving the mission was that this would ensure the firm would be first-to-market with better medical devices and service solutions as well afford the opportunity to discover new markets, thereby securing sustainable competitive advantage. The firm was keen to discover new market opportunities to escape a tendency towards incremental innovation and feature-based competition in its market. In the ensuing period, *Medical One* has undertaken several projects in its three core markets to acquire and assimilate external knowledge of customer needs and had begun to use this knowledge to influence core business activities in its innovation efforts. It had also originated a new capability for the profiling and selection of new market opportunities, informing all downstream innovation and product development activities. I shall discuss this development in detail in the case-study findings.

Crafting the research instruments and protocols

To guide the actual research, I used the conceptual framework (shown again in Figure Nine below) combined with the acquisition and assimilation components of the Zahra and George (2002) model of absorptive capacity to examine the underlying processes of dynamic capabilities, their origin and evolution.

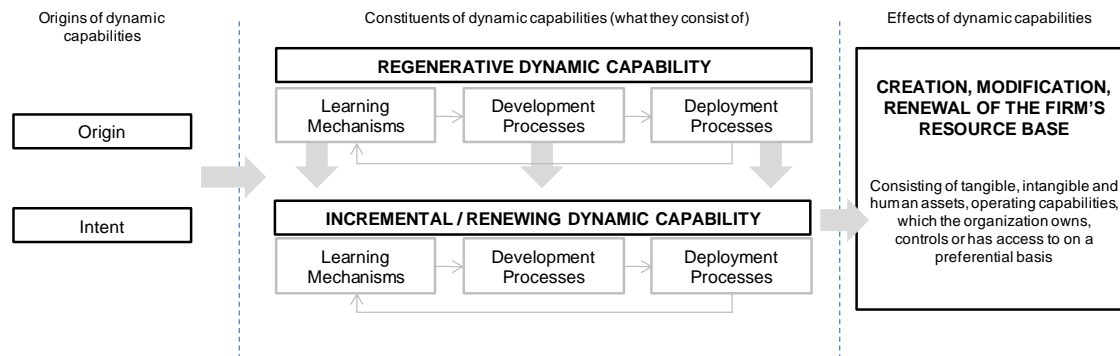


Figure Nine – Conceptual framework for dynamic capabilities

With the above framework and absorptive capacity constructs, I was able to structure the data collection from managers in *Medical One* using the following semi-structured interview questions:

- *Background* How did *Medical One* sense and seize market opportunities before it made a deliberate investment to acquire new external knowledge of customer needs?
- *Origin / Intent* What made *Medical One* decide to change how it sensed and seized market opportunities for innovation?? What did it want to change and why?
- *Development* What did *Medical One* do to change how it sensed and seized market opportunities? What processes and structures were developed to support the change?
- *Deployment* What did *Medical One* do to *deploy* the change? What mechanisms and processes were involved to acquire and assimilate new knowledge?
- *Learning* What did *Medical One* do to *learn* how to *evolve* and improve its approach? What learning mechanisms did it deploy to do so?
- *Effects* What effect did the change have on other activities? What effect did it have on the existing resource base?

The structure of the interviews and the gathering of the data followed a number of discrete steps. In the first instance, my conceptual framework for dynamic capabilities and the two chosen constructs of potential absorptive capacity – acquisition and assimilation – were used as the basis for a series of **9 first-round, semi-structured managerial interviews** with senior members of five different head office business areas, each of approximately 45-60 minutes duration.

The five different business areas are:

- **Market Insight:** This function is part of the “central competence centre” within *Medical One* and is responsible for all market data, information and market research programmes.
- **Research and Development (Concept Development):** The Concept Development division within R&D in *Medical One* manages individual product concepts as projects, developing their feature and functional technical and performance specification before handover to the Product Development division within R&D, for development.
- **Global Marketing (consisting of three Marketing Business Areas):** Global marketing is responsible for turning customer understanding into the insights needed for developing new products or service. It is also responsible for strategy development and product launches and is split into the three core markets or business areas of Ostomy Care, Wound and Skin Care and Urology and Incontinence Care.

All interviews were face-to-face or telephone and were recorded and transcribed professionally before being analysed. Thematic categories of data linked to the dynamic capabilities conceptual framework and absorptive capacity constructs and mechanisms were identified through a simple mapping technique (for an example, see Figure Ten below). The content of the semi-structured discussion guide is shown in Appendix One.

**Characteristics of internal knowledge
(drive the depth and breadth of understanding)
INCLUDES DRIVERS OF KNOWLEDGE GATHERING**

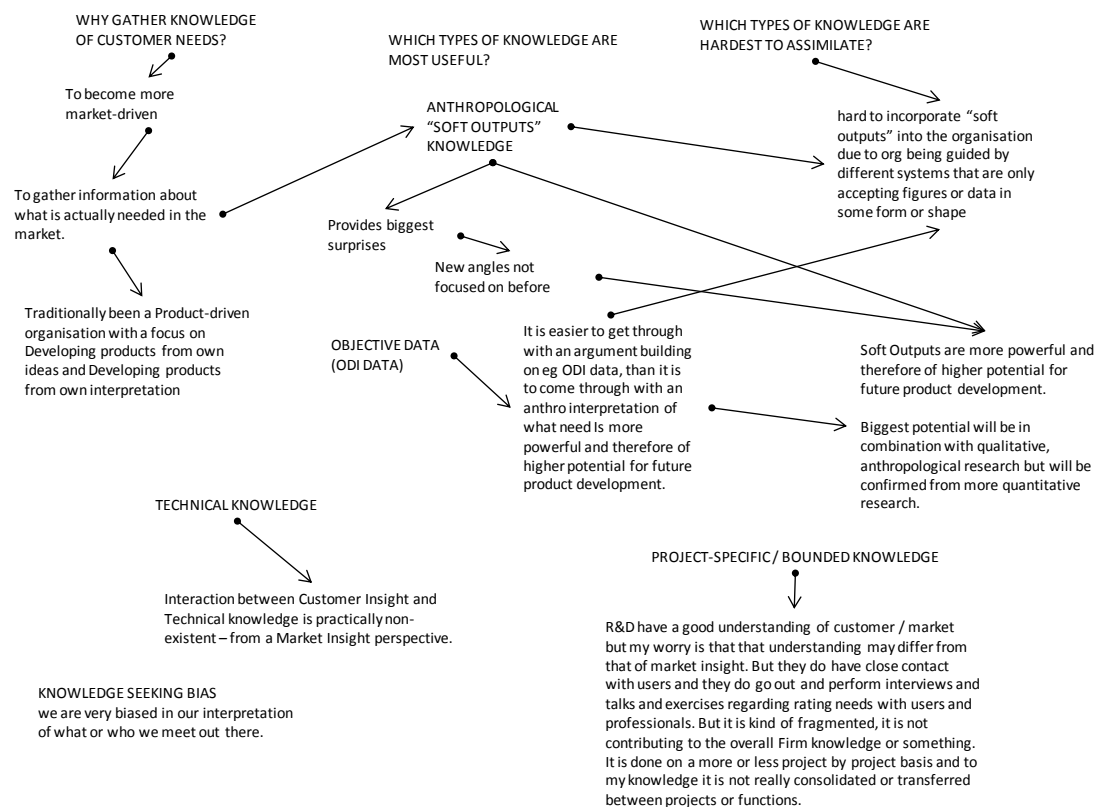


Figure Ten – Example thematic map produced following the first round of interviews

The interviews were supplemented with reviews of secondary materials including documents that defined new processes, policies and organisational structures and which described applied innovation programmes that used the new knowledge of customer needs.

Using data from the initial round of interviews, models of both the previous and the current activities related to absorptive capacity processes used within *Medical One* were developed and then further discussed and validated in a second round of **5 follow-up interviews with 5 of the same managers**, one from each of the different business areas. I was also able to refine with interviewees some aspects of the dynamic capabilities conceptual framework itself.

Table Three below summarises the interviewee roles, interview dates and the first round / second round participants. Note too that I have assigned a three letter code to each interviewee, which I shall reference in the case-study analysis.

Table Three – Business areas, interviewee roles, interview dates and first round / second round participants

Business Area	Interviewee roles	Initials	First Round	Second Round
Market Insight	Head of Customer Insight	HCI	All March 2009	
	Customer Insight Manager	CIM		
Global Research and Development	Head of Concept Development	RD1		Jul 2009
	Project Manager	RD2		
Ostomy Care Global Marketing	Director of Innovation	OC1		Jul 2009
	International innovation Project Manager	OC2		
Urology and Continence Care, Global Marketing				
	International innovation Project Manager	UC1		Jul 2009
Wound and Skin Care, Global Marketing	Director of Innovation	WC1		Jul 2009
	International innovation Project Manager	WC2		Jul 2009

In the next section, I present the findings and my reflections from the case-study.

SECTION FOUR: CASE-STUDY OF *MEDICAL ONE*

The presentation of the findings from the case-study follows the sequence of the questions outlined in section three above. Throughout, I shall offer my reflections on the origins, nature and evolution of dynamic capabilities and the influence of absorptive capacity, particularly the potential absorptive capacity constructs of acquisition and assimilation.

BACKGROUND

How did Medical One sense and seize market opportunities before it made a deliberate investment to acquire new external knowledge of customer needs?

The history of *Medical One* begins in the 1950s with a Danish nurse, Elise Sorensen. She was frustrated with the ability of ostomy products to give her sister a normal life following a bowel removal operation, a colostomy. Existing ostomy bags were cumbersome, unhygienic and costly, and failed to offer reliable protection. Moved by her sister's predicament, Elise Sorensen went about developing an appliance that would overcome these drawbacks. By today's standards, the product she invented was primitive, but it was the forerunner of all improvements achieved since. She patented the bag due to its "non-porous, thin and elastic" properties, its disposability and ability to be attached directly to the body without straps. It was one thing to have a patented product design, but another to find a manufacturer willing to take the risks of manufacturing a new and relatively untried product. In fact, Elise's idea had been dismissed by many manufacturers of medical products, so she turned to a small but successful plastic bag company that had deployed innovative welding methods that made its bags absolutely tight. The company was also able to tailor its plastic bags to the varied, individual needs of its customers. A sample of one thousand of the new ostomy bags were produced and sent by Elise to hospital contacts around Denmark. She also obtained publicity in a leading professional journal. Almost immediately, a flood of orders were received and *Medical One* was founded by Elise and her manufacturer in 1957. By that time, the company's products had achieved a reputation far beyond the borders of Denmark. Only two years after the company's birth, more than two thirds of its production was distributed internationally.

Since being founded in 1957, *Medical One* has expanded from ostomy care into two new markets, wound healing and skin care, and continence and urology. In all these areas, with values shaped by its founder's commitment, it seeks to work closely with people who have intimate healthcare needs. It is deeply driven by listening closely to customer needs and then responding with products and services that make their lives easier. I now summarise the findings from the interviews with the managers in the firm.

The innovation process within Medical One

In the first round of interviews with managers, I sought to understand how new knowledge of customer needs was acquired and assimilated within *Medical One*, what forms of such knowledge were captured and how this knowledge was then transformed and exploited for innovation. Also, I wished to learn what changes, if any,

had occurred in the types of knowledge sought for innovation as well as how processes for its acquisition and assimilation had changed and why. I also needed to understand the context of the firm's overall innovation goals and how they may have changed too. Importantly, I wished to determine the roles and involvement of the different business areas.

In the first instance, given that I had pre-selected a firm that had made a deliberate effort to develop a more explicit market-orientation, I sought to understand what forms of external knowledge *Medical One* acquired and assimilated before it made its decision to adopt a more market-based approach. I shall term this former approach, the "Before Process". Next, using interviewee feedback, I describe it.

"Before Process"

First, the R&D manager (RD1) explains the role of R&D in the "Before Process" and provides clues as to how their involvement had changed over the time period of the research study:

We were an organisation whose innovation was driven very much from R&D. R&D used to fabricate a product concept based on its own experiences and then set-up a dialogue with users about the concept. From that dialogue, we derived the needs on the concept to refine it. R&D would most likely scope an idea and then drive them and their projects through the organisation. The kind of knowledge we had in R&D was very dependent on the individual actually having and seeking this knowledge. It was also very project related. It was also formal insight gathering, driven by specific projects, often with a specific technical feature behind it.

The "before process" was characterised by a concepts-first project approach, driven out of R&D. Concepts for new products were generated by R&D internally and were based on existing pre-held knowledge about perceived customer needs and market opportunities. Once the concepts had been defined, R&D personnel visited customers and sometimes held advisory boards with health care professionals to discuss and validate the concepts. By putting the idea- or concept-generation phase *before* the engagement with the customer and the discussion about their needs, this had implications for the types of external knowledge sought by R&D personnel, as well as the search and scoping methods used, as an international innovation project manager in wound care comments (WC2):

We would try and understand our customers by involving them, e.g., using advisory boards, but it came down to the way we engaged the customer. You can either lead their answer or you can try to capture their understanding. In the past, we didn't ask the questions of customers correctly and we were also motivated by the result, meaning we would try to impose the concept on the customer, instead of trying to hear what they really think, their underlying needs. There was a tendency to look for solutions in our existing products so if a customer told us they have this problem, we will always say we have a solution to that problem among our products. Put simply, we were very focused on what our products can do rather than what improvements our customers wanted.

Medical One R&D had pre-held assumptions about the product concepts customers wanted. Pre-existing beliefs set the search scope and parameters for engagement with customers and health care professionals, and therefore the additional external knowledge captured. As Cohen and Levinthal (1989) suggest, stocks of skills and of prior knowledge were influencing how *Medical One* acquired and assimilated new

external knowledge. In effect, there was an internal filter in place that conditioned or influenced which concepts were generated, how they were validated and which were selected to be added to the product development portfolio. A director of innovation, wound care (WC1) explains the role of strategy and other factors in conditioning this idea- or concepts-first approach:

In terms of setting search scope, we used to have fairly formalised strategic plans with objectives and also business plans by market with an idea of where we wanted to invest and direct our innovation efforts. R&D would follow these at a high level. These plans were defined in terms of technologies because the way that the markets were monitored was around the technical solutions, for example negative pressure therapy, hydrocolloids or anti-microbials. The way we define markets and therefore searched for opportunities was by technology area not by customer needs.

The way *Medical One* defined its markets – in terms of technology solution categories – conditioned its search for product development opportunities in those markets. What's more, the categories were formalised in the strategic planning process and provided the lens through which external knowledge was sought to feed R&D-led concept generation and product portfolio planning capabilities. As an R&D manager states (RD1):

We were led by our own ability to innovate on features - our own existing knowledge. In our experience, our employees inherited a company truth about customers and our products. And sometimes when we talk to our customers, these are not always the truths that they perceived or held.

There were some important within-case differences in *Medical One* concerning the balance between the use of external technological knowledge and customer needs knowledge. In the wound and skin care market, the scientific knowledge needed to develop products together with often stringent regulatory and testing requirements defined the types of external knowledge needed, as an international innovation project manager explained (WC2):

We've been much more reliant on technical knowledge than knowledge about users because our products are much more complex. In these markets, the complexities and legal requirements make it more difficult to develop exactly what it is that the customer needs because it takes longer to actually test it. We can't just do a mock up of something and put it out there because that would not be allowed. So it's a longer process and more reliant on technical knowledge inputs.

Three marketing business areas existed independently of R&D and although sometimes working together, they would often conduct their own market research and undertake their own customer engagements to capture knowledge for marketing, segmentation, clinical trial or regulatory approval purposes. Customer needs data was captured in an ad hoc way with only limited structure and low repeatability. Various methods and tools were brought in from third parties on an experimental basis in the hope they would reveal valuable new insights about customers and markets.

“Before Process”: Summary

The defining characteristics of the “before” innovation process are as follows:

- *Medical One* had an R&D driven, technology/product-orientation approach. Markets, business strategy and objectives were defined in terms of technology / solution areas.

- A “concepts-first” approach used the existing resource base of technical and scientific knowledge and competence to generate a high volume of ideas. This knowledge was acquired using the concept as the basis for the external search scope. Concept generation sat at the front-end of the firm’s entire innovation process. Once generated, the concepts were validated and tested either internally or through further engagement with customers. Critically, in these engagements, the unit of analysis for external knowledge capture was the *concept* itself not the *customer need*. Collectively, these activities were termed concept generation and testing.
- Concepts and ideas were then filtered using various criteria: Strategic, commercial, marketing, sales distribution capability, medical reimbursement cost and likelihood, intellectual property potential, customer approval, technological capability. This knowledge also drove the scope of idea- and concept- generation in the first place. Collectively, these activities were termed product portfolio planning.
- A formal, gated approval system in product portfolio planning exercises was used to add or reject concepts after their internal or external validation. At this gate, concepts and the knowledge arising from their validation were further assimilated within R&D and the learning derived from these experiences shaped future concept generation efforts and actions. This learning was socialized within R&D and in structured concept review meetings. Here, concepts that were approved were added and handed-over to the product development teams whereas others would be rejected. Some concepts would refine existing products in the development pipeline.
- The three global marketing business areas within *Medical One*, one for each of their core markets described earlier, conducted their own customer needs capture using external market research agencies and internal user and health care practitioner advisory boards. These activities were relatively un-coordinated and were conducted in response to an external event or to meet specific objectives.

In Figure Eleven below, I provide a conceptual representation of how the “before process” worked, the roles of R&D and the marketing business areas and the types of external knowledge captured. This model has been validated by managers in *Medical One*.

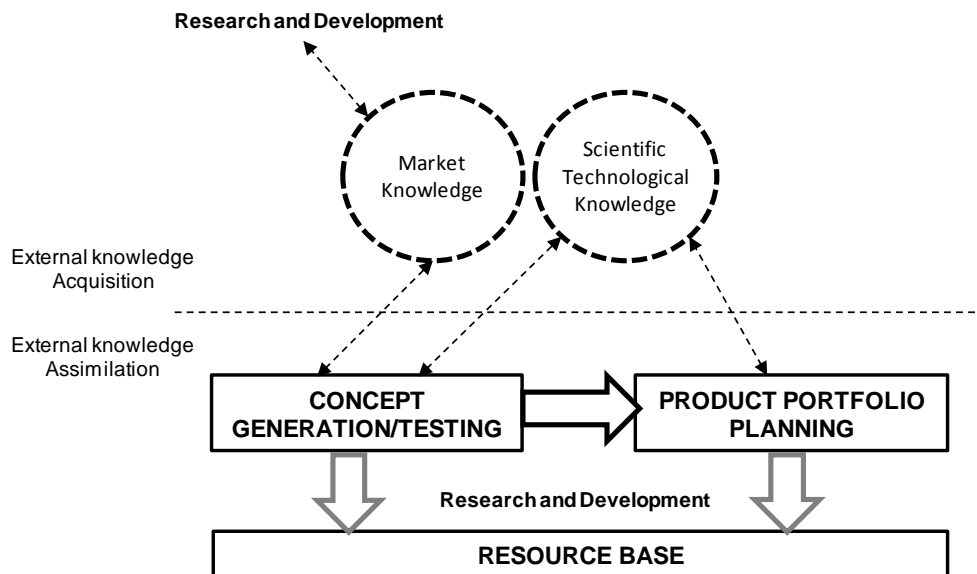


Figure Eleven – The “Before Process” in *Medical One*

Reflections and resource base effects

The “before process” within *Medical One*, defined by a concept- or ideas-first approach, is implicit in much of the R&D-biased absorptive capacity literature. It is characterised by analysis of how existing prior knowledge determines how firms recognize the value of new technical / scientific knowledge, assimilate it and then apply it to commercial ends. This can be seen in *Medical One*. The prior technical and scientific knowledge that existed within the firm shaped its outlook on innovation and firm growth. It determined how it defined its markets, how it scoped its search for opportunities, where it looked for them, the types of knowledge it sought, how that knowledge was assimilated within the firm and ultimately, what concepts and products it invented, developed and brought to market. The resource base was modified along a path dependent trajectory with similar types of knowledge content.

Using the definitional elements of dynamic capabilities listed in table two, I characterise *Medical One*’s approach to concept generation in the “before process” as an incremental dynamic capability (after Ambrosini, Bowman and Collier, 2009). Concept generation and testing brought about mainly incremental improvements in technological and scientific knowledge in the resource base as well as some understanding of customer needs. Operating in relatively stable market conditions, this incremental modification of the resource base was sufficient to sustain *Medical One*’s competitive performance for a number of years. Concept generation and testing fed its product portfolio planning process, which can also be termed an incremental dynamic capability. In the same way, it produced incremental feature-based improvement to existing product lines. Products can be considered assets in their own right within the resource base of the firm. Using the dynamic capabilities conceptual framework, I position concept generation/testing and product portfolio planning in relation to their effect on the resource base in the “before process”. This is shown in Figure Twelve below.

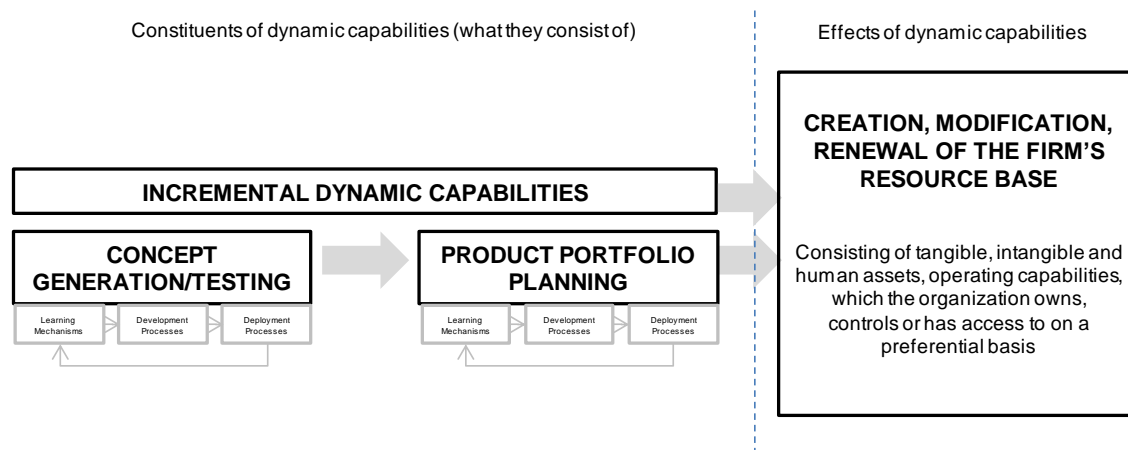


Figure Twelve – Concept generation/testing and product portfolio planning as incremental dynamic capabilities and their effect on the resource base in the “before process” at *Medical One*

Next I describe why *Medical One* decided to change the “before process”.

ORIGIN / INTENT

Origin / Intent

What made Medical One decide to change how it sensed and seized market opportunities for innovation?? What did it want to change and why?

The interviews revealed a number of reasons why *Medical One* wished to change its approach for generating concepts and for product portfolio planning. First, interviewees stated that there was no significant exogenous event or condition that compelled the company to review its existing approach. On the contrary, market conditions had been stable for many years and the firm had steadily co-evolved its capabilities with other long-established competitors and market institutions such as government health care systems. An innovation director, ostomy care (OC1) describes the intent behind the decision to change:

Put simply, there was a need for strong market differentiation. It was hard to come up with something novel. There was a desire to be more creative in a structured way. We were fighting the wrong battle with our competitors and everything we did was too incremental or product feature-based. Some of the markets were saturated with products so for us to really differentiate ourselves we needed to get more knowledge of a different kind.

This passage indicates how *Medical One* realized that it needed to change the way it viewed its markets and to capture new knowledge about the market opportunities that existed within them. An international innovation project manager, urology and continence care (UC1) expanded on this point further:

To be able to innovate meaningfully, it is absolutely necessary to know what is going on in the market. Historically we were a very strong technology-driven company, where we have a very strong and clever R&D Department which would come to the marketing department and say, “look, we’ve got this fantastic concept, do you like it and do you want to sell it?” Now we wished to turn that around by saying “well, maybe we should go and figure out what the customer needs are first and then try to develop on the basis of that knowledge instead of doing it the other way round”.

The same project manager (UC1) explained the internal influences that led to internal reflection of *Medical One's* innovation process and the types of knowledge used:

In essence, it was a wish to be more innovative, to see beyond the next feature. It came from management as well as employees when we started to ask “why aren’t we that successful any more compared to ten years ago?” So, we looked at the why very deeply and found that we weren’t getting close enough to the customer. Sometimes we were wrong and that had been very costly. Our concept-driven approach was not producing the more breakthrough products and new market opportunities we were seeking.

Furthermore, there was a strong cultural heritage driving the change, as embodied in the story of how *Medical One* was founded. The market insight manager (MI1) mentions:

We really wanted to know all about our users so we appear as a company that has a user driven innovation profile.

Medical One's values-based path dependency linked to its founder did much to drive the intent to originate a customer-oriented perspective.

Reflections

In their definition of dynamic capabilities, Helfat et al (2007) state that a “degree of intent” or purposefulness characterizes their origin and ongoing evolution. Even if not fully explicit, dynamic capabilities can be distinguished from other more rote organisational activities that lack such intent. Clearly, at *Medical One* in 2007, there existed a degree of internal dissatisfaction with the performance of the prevailing concept-first and R&D-led approach. There existed plenty of purposeful intent to improve the approach.

Next, I now explain how a change in the innovation process was brought about.

CONSTITUENTS OF DYNAMIC CAPABILITY

Development

What did Medical One do to change how it sensed and seized market opportunities? What processes and structures were developed to support the change?

In 2005, *Medical One* began to experiment with new approaches to concept generation/testing. An international innovation project manager, wound care (WC1) describes exactly what happened:

The organisational transition started in one business market area actually about 4 years ago when we were a separate business unit with profit and loss responsibility. We actually made an experiment where I was put in as a marketing person with some R&D People. This was actually the beginning of the transition. As a combined R&D / marketing team, we were tasked with developing new concepts together. It was a journey that started at that point which we later adopted for the whole organisation. Then, two years ago, the organization officially created the marketing innovation departments and at that time it was still a journey because as I see it now, it was probably a shock to the R&D department that all of a sudden the marketing people were given responsibility to decide what they should do. I think it took some time before they figured this out that we could do some things together and that it wasn’t necessarily a bad thing that the marketing people were the ones to make decisions.

Also in 2007, the 50th anniversary of the founding of the company, a directive came down from management which stated that all employees should go out to visit and talk with at least one customer, to learn about their needs. A director of innovation, ostomy care (OC1) explains:

In 2007, a goal was set for every worker to meet a customer. It was a very successful way of getting everybody closer to the customer. However, there was a negative. Everyone who visited a customer and listened to their needs then held those needs as “the truth” which meant that now everybody had their own little view of what it is the customers wanted. I think it's very positive that we try to get everybody to see a customer once in a while yet on the other hand we need to make sure that everyone understands that the one customer you've seen is not representative of the whole market!

Given its heritage, *Medical One* had a cultural disposition to getting close to its customers. This was reinforced when all employees, not just R&D personnel, visited customers. The visits were valuable experiences, not only for reinforcing the company's heritage and values, but also by demonstrating some of the pitfalls of engaging in open dialogue and knowledge capture with customers. The conversations held were relatively unstructured and it is interesting how the “personal truths” gained about what customers wanted were quickly dispelled or disputed when the knowledge was shared and assimilated back in the office. This was the first of many later difficulties encountered in integrating new knowledge with existing knowledge. Managers in the interviews confirmed that these visits were a highly valuable learning mechanism that led to the rapid accumulation of customer knowledge. However, they also emphasized that there was a need for a more structured, coordinated and regulated process for knowledge capture as well as its assimilation. An R&D project manager (RD2) emphasizes the importance of the early-stage activities such as the customer visits to make employees think differently:

It was important we put into place a driver of a different way of thinking. The visits forced a lot of people to think differently and very hard about what are user needs and knowledge. It allowed more parts of the organisation to think about user needs. It also forced R&D to get out of their project box to look at users in a more holistic way.

Two significant decisions were then instigated by *Medical One* management in 2007. The first was the creation of a Market Insight function with a dedicated customer insight unit that held the responsibility for coordinating the three marketing business area activities and promoting best practice when capturing knowledge of customer needs. Individuals in this unit were brought in from the marketing business areas and the department held budgets for projects with external agencies. Its customers were the three marketing business areas and corporate functions such as marketing and brand management. A director of innovation (OC1) explains why the Market Insight function was set-up:

Before Market Insight, we were not so good at leveraging the learning from the various market and customer studies. Put simply, it was difficult to inform everybody about everything. The difficulties were in the transfer of the learning. For example, there were local activities and studies in our subsidiaries that weren't submitted to HQ. At corporate level, one department had some learning but it was not transferred to another department. Also, we did not transfer learning in one marketing business to another where it might have been useful. To compensate for these shortcomings, we created the market insight department.

The second decision was to remove the responsibility for sensing of market opportunities out of R&D altogether, placing responsibility for it instead in each of the three global marketing business areas, namely ostomy care, wound and skin care and urology and incontinence care. In effect, they each became an innovation unit focused on their own markets. By shifting this responsibility out of R&D, *Medical One* formalized its intent to adopt a more coordinated, customer needs-driven, market-oriented approach. It gave each marketing business area the scope to develop capabilities for gathering knowledge of customer needs, to deploy new processes and learning mechanisms and for the ongoing identification and prioritization of market opportunities. The new market insight function acted as the capability development and investment management mechanism for the acquisition and assimilation of external knowledge of customer needs.

An important requirement for the new structure to work was to find new mechanisms to formalize the exchange and assimilation of knowledge about customer needs, product and market opportunities between the marketing business areas and R&D. This would ensure that R&D developed products that addressed those needs and opportunities so that the knowledge was correctly exploited. In early 2007, following a review by an external consultancy, it was decided to establish three new teams within each marketing business area, each of whom would undertake a new process to facilitate the gathering and handover of customer and market knowledge - in the form of market opportunities - to R&D. This process was called *Product Profiling* and its goal was to produce a number of *Target Product Profiles* (TPPs) that defined product and market opportunities. Two of the objectives in the Ostomy Care's Product Profiling department's mission statement summarise the teams' new role:

- The goal is to develop TPPs (target product profiles) which are the foundation for concept development of new innovative solutions for users
- There will be a strategic focus rather than an opportunistic focus, a market-driven approach rather than a technology/product-orientation approach and a focus on "do different" rather than to "do better".

(Source: OC Product Profiling: OC Product Profiling: Driving foundation for development projects in pre-pipeline (May 2007))

Target Product Profile - Biatain AgP

Project description	Current silver containing products for moist wound healing has limited effect towards xx% of the bacterial infections. Medical One would have a significant opportunity if this could be solved
Indication	Exuding wounds with bacterial infection
Unmet need	Current dressings with silver only are not very effective towards Gram Positive bacteria, which accounts for 20% of the infections
Prevalence/incidence	xx % of leg, pressure and diabetic foot ulcers are infected, corresponding to yy wounds a year in EU and US
Potential marketing claims	Fewer Gram positive infections leading to faster wound healing; Targets feared multiresistant bacteria MRSA, VRE, streptococci.
Product characteristics	Dressing or gel with anti bacterial effect which has x days wear time and same release profile for the silver as today
Key competitor products	All antibacterial dressings (presently only dressings with 1 active agent)
Difference from competitors	Improved anti bacterial effect on the most pathogen group of bacteria: Multiresistant Gram Positive bacteria
Launch time wish	A solution product should be ready for launch in xx months.

Figure Thirteen – Summary Target Product Profile Output

(Source: OC Product Profiling: OC Product Profiling: Driving foundation for development projects in pre-pipeline (May 2007))

Each TPP would be defined following the capture and prioritization of customer needs and other market-based information. Each would denote the terms of reference for a *Medical One* product concept and would consist of an assessment of potential market acceptance, commercial opportunity, customer needs, potential marketing claims, outline product characteristics, competitor differentiation characteristics and expected launch time criteria. All TPPs produced in each marketing business area were based on the development priorities set in their business area strategy statements. In Figure Thirteen above, I depict a high-level summary output of a TPP with some confidential content hidden.

Reflections and resource base effects

Medical One's restructure in 2007 formalized its intent to use more of its marketing- and customer knowledge in its existing resource base as well as capture new forms of external market and customer knowledge to drive the TPP process. The goal was to renew the R&D-driven incremental dynamic capabilities of concept generation and product portfolio planning with new forms of knowledge inputs. Market Insight would oversee the methods used to capture the external knowledge and would also perform a coordinating and knowledge assimilating role.

The Target Product Profiling process and Market Insight function combined would constitute a regenerative dynamic capability for sensing, gathering, profiling, and then assimilating market opportunities into the R&D product pipeline. A process and matching organisational structure was established with the deliberate purpose of regenerating the current set of dynamic capabilities which were perceived by managers as no longer relevant, or capable of achieving new resource configurations. *Medical*

One felt a threat of stagnation in their market owing to a lack of breakthrough innovation concepts. Thus, I would argue that a regenerative dynamic capability had been originated and the underlying structures for its operation established. The next challenge was to find the content knowledge needed for identifying the TPPs and the additional process knowledge needed to actually deploy the new dynamic capability and orchestrate further changes to the resource base. Using the dynamic capabilities conceptual framework, I position the new TPP regenerative dynamic capability in relation to its effect on the resource base and existing incremental dynamic capabilities of concept generation and product portfolio planning. This is shown in Figure Fourteen below.

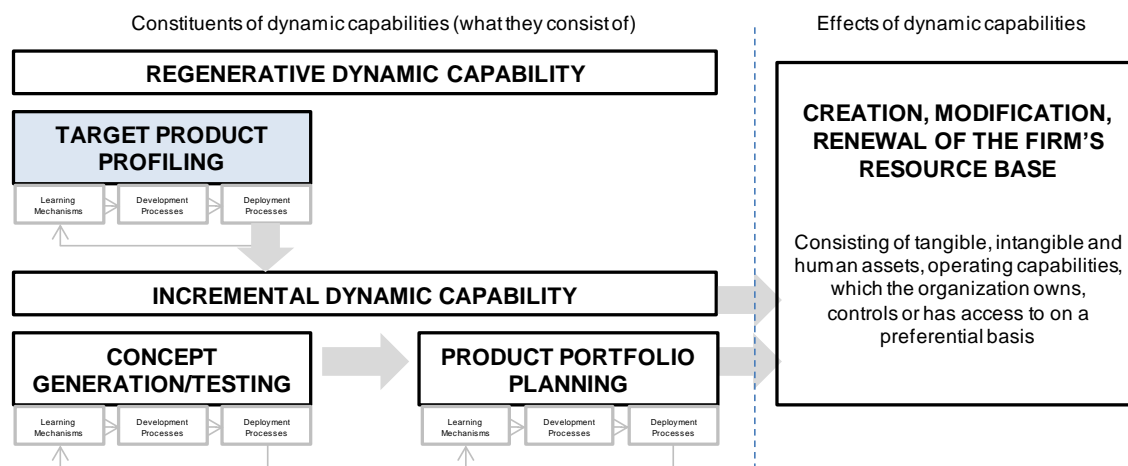


Figure Fourteen – Target Product profiling as a regenerative dynamic capability and its effect on existing incremental dynamic capabilities

Deployment

What did Medical One do to deploy the change? What mechanisms and processes were involved to acquire and assimilate new knowledge?

To complete a TPP, *Medical One* needed to develop new processes for market opportunity identification, prioritisation and assessment, augmented with existing more rote activities of competitor analysis, financial analysis and business case evaluation. In each of the three global marketing business areas, a target product profiling team (consisting of two or three people) worked with Market Insight to search for new methods for gathering customer needs and identifying market opportunities. A number of informal search activities were undertaken that entailed attending conferences, networking events and reviewing published documents to identify best-practice processes and methods. A review of previous market research projects was also completed. Early pilot experiments were then conducted to test new methods.

Managers in the sample were interviewed about the processes that were deployed for acquiring and assimilating external and existing customer and market knowledge, and for formulating Target Product Profiles (TPPs) within *Medical One*. With these inputs, I summarise what I shall term the “change process” within the firm.

“Change Process”

Creating a TPP required a different starting point for external knowledge search compared to the “before process” characterized by the R&D concept-first or project-focused approach, as an R&D manager (RD1) describes:

User insights were now to be gathered in a more holistic and not in a project-driven fashion. This meant that now we would collect a lot of knowledge that we would not necessarily have an immediate use for. But, this knowledge is not “not important” because we will not use it but rather just we didn’t have that knowledge before, because we only collected what we needed. We felt it was important to understand the full picture of customer needs so that we had all the pieces of the puzzle, should we need them.

To facilitate the gathering of user needs in a more holistic way and to identify market opportunities, the Ostomy Care global marketing business area experimented with a tool called outcome-driven innovation (ODI) provided by an external innovation management consultancy. The director of innovation (OC1) in this marketing business area explains how ODI worked and its benefits:

ODI was a non project-specific, end-user gathering tool that gave us the big picture of opportunity themes in the market, that is, areas of unmet customer need. Using ODI was a good place to start, because it also allowed us to prioritise those themes of unmet need and then after that, we used other methods to dig deeper into them. This meant we could decide where to focus and we could determine what customers meant when they say this and that. The result of an ODI study was a clear, specific direction for what is most important to work with. With ODI, we avoided developing products based on gut feeling, the boss’ pet project, etc.

Since 2007, ODI has been used by all three global marketing business areas to produce the following forms of external market knowledge for *Medical One*:

- *Detailed user innovation priorities or unmet needs at the broad market level.* These priorities reflected the importance and satisfaction users currently had with existing products, brands and situations they had to deal with. Each detailed need statement was measured and given an opportunity score. The higher the score, the greater the opportunity.
- *Strategic innovation themes consisting of groupings of detailed user innovation priorities.* Each theme offered potential to develop new products, technologies, or business models that would be valued by users. The themes would form the primary terms of reference for the TPPs and later, the focus for concept generation/testing. *Medical One* also used this knowledge to review its existing pipeline of products in development.

An example of the format of the knowledge of market opportunities produced using the ODI methodology is shown in Table Four below. The table shows examples of customer need statements from an ODI study performed by the Urology and Continence Care TPP team. This was the third of four such studies undertaken by the marketing business areas, two of which were completed by Ostomy Care (May 2007 and February 2009), and one each by Wound and Skin Care (February 2008) and Urology and Continence Care (September 2008).

In each study, up to 200 customer needs were identified by the TPP teams through a series of external customer interviews, undertaken jointly with an external

consultancy. Once captured, all the needs were then rated for their importance and the ability of current products to satisfy the need by a large sample of customers using a web-based survey. The needs were then ranked according to the degree of difference between importance and satisfaction, thereby revealing the most significant market opportunities.

Table Four – Summary view of ODI customer need formats, opportunity scores and ranking

CUSTOMER NEED	IMP	SAT	OPP	RANK
Minimize the time it takes to determine that a continence product/system that collects urine has stopped working, e.g., a drainage bag has detached from the body, a tube has come loose, a tube has been pinched, etc.	9.0	3.0	15.0	33
Minimize the likelihood that a continence product punctures the bladder when inserted through the urethra	8.7	4.3	13.2	34
Minimize the likelihood that damage to the urethra is caused when a continence product is removed	8.2	3.1	13.2	35

Although an external company ran the ODI process to capture, codify and prioritize the market opportunities, *Medical One* developed their own internal processes for making sense of the results and for grouping the needs into clusters of opportunity. It also supplemented the data with its own external market knowledge gathering activities to add depth and meaning to the quantitative data from ODI. These activities included focus groups, 1:1 customer visits, lead user studies, psychological interviews, professional advisory board meetings and anthropological studies. Many of these activities were conducted through *Medical One's* overseas subsidiary operations. In the majority of these activities, the unit of analysis was the user's innovation priorities rather than a concept or idea for new products, reflecting a switch in orientation from the "before process".

Once the opportunities had been identified, Market Insight facilitated internal workshops to assimilate the new knowledge with existing knowledge, and to add further meaning to the findings. These workshops were attended by R&D concept generation and testing personnel. The goal was to cluster the opportunities into "opportunity themes", then review and score them using criteria such as:

- *Medical One's* scientific / technological capability
- Likelihood of a theme leading to new products, new technologies, and/or new business models
- Ability to be brought to market within a pre-defined time window
- Current social trends and/or solution trends in the market
- Likelihood of adoption by users
- Ability to be delivered through the current distribution model
- Potential to piggyback on current product platforms
- Results of discussions with lead-users, other users and health-care professionals

The market insight manager (MI1) describes why these initial opportunity theme clustering and ranking workshops were important for the assimilation of customer needs into the existing knowledge base:

It is important we share because we are now at the focal point for getting new information into the organisation. It goes without saying that unless that information or knowledge is spread within the organisation it is of no value. We need to be aware of how we share and that sharing is a vital part of making market research fulfil our needs. So it needs to be shared and not in a manner where it's not just information being passed around. It has to be blended together otherwise it's a little academic. It's good that some are responsible for carrying out ODI studies and so on, but given all the information coming in, we needed to share the experience of evaluation, prioritisation and understanding – the whole process before you actually have the final slides that are used and presented. We need to be part of that – and that's very important.

However, it was in the assimilation phase of the new external knowledge that *Medical One* began to experience some difficulty with the new TPP process. The market insight manager (MI1) continues:

The biggest difficulties centred on the softer or more qualitative outputs, particularly those coming from anthropological research, that provided us with new angles on customer needs that we had not known before. We found it hard to assimilate findings like that into an organization that had traditionally been guided by systems that were hard-coded with facts and figures. It was easier to share the ODI data than it was to come up with an anthropological interpretation which may often have had a higher potential for product development.

To address this problem, many meetings were held and several different formats were tested for sharing and discussing the new market knowledge internally. Yet the major hurdle concerned integrating the different knowledge bases held by R&D with those of the global marketing business areas, particularly as the former held the view that they already had extensive knowledge about customer needs, derived from their activities in the “before process” as well as ongoing customer insight work focused on product concepts. Power dynamics began to emerge between the marketing business areas and R&D with many discussions concerning who held the “truth” regarding what customers wanted. The market insight manager (MI1) explains:

R&D has a good understanding of customers and the market but the problem was that that understanding differed from that of the marketing business areas. R&D maintained their own close contact with users, they would go out and perform interviews and talks and exercises. But they did so in a fragmented way and did not contribute to the overall knowledge with the company. It was still done on a more or less project-by-project basis and was not really consolidated or transferred between projects or functions.

The difficulties of assimilating the market opportunity themes with the new and existing knowledge base held and captured by R&D led some to call for new systems to codify all the customer and market knowledge that existed in the company. An international innovation project manager in global marketing, urology and continence care (UC1) explains:

We needed some kind of system to facilitate sharing. It should not be the main driver but it has to be a better than the database we have today which is designed for storing knowledge not sharing knowledge. We have a lot of people that know a lot of things and if we gave them an easy way to put it in and build on other people's knowledge, then I think that would be brilliant.

Another project manager (OC2) disagrees:

The solution has always boiled down to needing a system but to me that's not needed to encourage knowledge-sharing. Rather we have to build it into our reward system. As it is today, not a lot of people are rewarded for transferring knowledge. There is no incentive to spend this much time telling other people what you know. Also, it's not because they don't want to share but rather sometimes our organisational structure and different priorities seem to just make knowledge sharing difficult. We don't have the right tools to make knowledge-sharing easier. I think what drives people to work sometimes is that they have specific knowledge they wish to share, and they want to be part of a bigger picture. It's not about power balance and so on but it's about the lack of ability to do so, it's about knowing who has the knowledge and overcoming their hurdles to contribute.

This statement reveals that *Medical One* had not yet fully developed a capability for the effective assimilation of the market opportunity themes with the tacit knowledge held by individuals, and also the different knowledge bases held by the marketing business areas and R&D. Despite the assimilation difficulties experienced, at least a dozen Target Product Profiles were produced over the course of the two year period. Many were developed further into initial concepts by R&D Concept Development. A high-level summary of an ostomy care concept is shown in Figure Fifteen below.

Minimize the risk of leakage from a burst output bag.

ODI score: Importance 92%, Satisfaction: 24%

Reduce risk of leakage from sudden bumps and pressure

Sometimes you can experience a leakage due to sudden bumps and pressure on your ostomy appliance.

Now you can feel secure that your ostomy bag can withstand every day challenges, such as pressure from a car seat belt, bumping into furniture, playing sport, or carrying a child without causing sudden leakages.

The new ostomy bag is developed to withstand everyday situations that can challenge the strength of the ostomy bag. All materials and mechanical parts of the bag are selected because of their ability to withstand stress and pressure, without compromising on comfort and discretion.

Your new reinforced ostomy appliance will allow you peace of mind from the worry of a leakage due to sudden bumps and pressures.



Figure Fifteen – Example summary concept (Ostomy Care)

Change Process: Summary

The defining characteristics of the “change process” are as follows:

- *Medical One* formalised a market-driven, customer needs-oriented approach, at least in the marketing business areas. However, markets, business strategy and objectives were still largely defined in terms of technology / solution areas.

- Three new Target Product Profile functions, one in each of the three marketing business areas, was responsible for gathering insight into market opportunities and then producing business cases of pre-concepts for handover to R&D for concept generation.
- The TPP teams implemented a formalised methodology (ODI) to identify, codify and prioritise important market opportunities. They also blended this codified knowledge with other forms of new and existing market research. R&D was not included in these activities and the responsibility for identifying market opportunities was wrested from R&D at the same time, R&D continued its own customer engagement and dialogue around its product concepts.
- The TPP teams experimented with a number of different mechanisms to handover the TPPs to R&D concept generation. These included clustering and opportunity scoring and selection workshops. It was in the assimilation of the TPP that the difficulties with the new process were encountered.

In Figure Sixteen below, I provide a conceptual representation of how the “change process” operated, the roles of R&D concept development and the global marketing business areas and the types of external knowledge captured. This model has been validated by managers in *Medical One* in the second round of interviews.

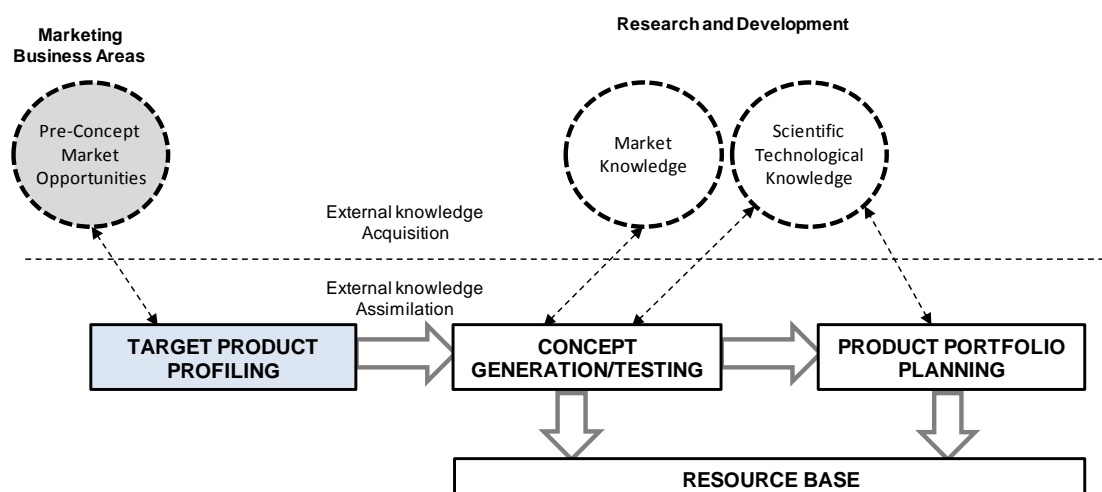


Figure Sixteen – The “Change Process” in *Medical One*

Reflections and resource base effects

Several TPPs were produced in the two years following *Medical One*’s restructure. Yet the regenerative dynamic capability it instigated for producing them was still evolving, particularly the mechanisms it needed to assimilate the new knowledge, the process of handover of the TPPs to R&D and in the cross-functional relationships that supported it. There were growing calls to bring the marketing business areas and R&D closer together, to identify which knowledge gathering activities they were each working on and to consolidate knowledge assets from different business areas that added value to one another. I now describe the learning that took place and the effects it had on the TPP regenerative dynamic capability.

Learning Mechanisms

What did Medical One do to learn how to evolve and improve its approach? What learning mechanisms did it deploy to do so?

Since its instigation in 2007, managers in *Medical One* have introduced additional processes to improve a number of aspects of the TPP dynamic capability. They include better integration, coordination, knowledge combination and learning mechanisms across the marketing business areas and R&D. I now describe these developments which I term the “after process”.

“After Process”

First, managers identified a need for enhanced transparency of market knowledge-gathering activities across the marketing business areas. They perceived that not all activities were sufficiently aligned with business area strategy and so were keen to derive a better return on investment on individual knowledge gathering projects, as well as achieve better complementarities on the findings across the marketing business areas. A project manager describes (OC2),

We have an exercise now where we need to identify all the activities that we have, and we have to meet with other functions to get a full picture of these activities. A lot of these activities are still carried out by individuals but we need to be a little more rational about it so that we do the right things that are more aligned with strategy and so on.

Second, there were calls to redefine the search scope of the market knowledge gathering activities. Since 2007, markets had still been defined in terms of product or technology solution areas. A director of innovation explains that there remained potential for improvement in how *Medical One* set its search scope (WC1):

We still haven’t really cracked the nut yet because we do in my view far too many incremental line extensions to support our product lines. But for true innovation, the way we need to work is to fundamentally change our view of our markets, our customers and their needs, even think about new business models altogether. That’s true innovation. We are still not in a situation where we work effectively to identify those opportunities at a high-enough level. We tend to put those opportunities into what we already know. It is still feature- or incremental driven.

Managers in the second-round of interviews also explained how *Medical One’s* culture was beginning to influence attitudes towards its organisational structure and processes, and how it was important to begin to encourage and embed an organisational mindset to think differently about markets. A director of innovation explains (WC1):

It’s about changing the culture. For us, it’s been a big step to take innovation out of R&D and put it into marketing. Marketing now sets the direction of where the opportunities are. This has been one big change. But it’s also a big change to take it to the next level which is to find a way to distinguish between line extension or maintaining the existing portfolio, on the one hand, and then capturing new business opportunities on the other. How we change this is to scope our search for opportunities differently. We need a wider scope and to turn research into insights and opportunities. I think there is a limit to how much process we can put into it and I think it is really more about the way we work. But it has been hard to overcome resistance to this thinking. It is really important to have the right people to be confident enough to follow this approach. It is more about behaviour, mindset and culture.

Third, interviewees stated that the TPP process had not been conducive to R&D and marketing integration, and that new mechanisms were needed for better co-ordination of activities and assimilation of knowledge. To facilitate this integration, a formal, best practice community was set-up in 2009 with the twin objectives of addressing the lack of co-ordination of external knowledge capture and improving the assimilation of new knowledge with existing knowledge across and within the global marketing and R&D functions. The community now meets regularly to review the process of TPP creation, to examine methods for the acquisition of customer needs and the opportunity themes produced to date. Also, it searched for ways to improve mechanisms for transferring the learning to R&D. An R&D manager explains how the community works (RD2):

We are now hosting bi-weekly meetings between concept development and the marketing areas to talk about projects, tools, processes and user needs. It is sort of a “front-end community” we are trying to establish with people coming in from different functions who are motivated to work in and improve the front-end. Now we try to push sharing and integration at every opportunity. We do that continuously. We try and keep it informal. We don’t wish to over-formalise these. We don’t want to hardwire the knowledge as that can lead to rigidities.

The community and other more informal learning mechanisms had the effect of diminishing the formalized structure of the product profiling process and the inherent division between the marketing business areas and R&D. Instead, employees find their own way to work with external knowledge using new social mechanisms for knowledge exchange. Processes for acquiring external market knowledge are slowly becoming socialized, informal and embedded within *Medical One*. A director of innovation (WC1) describes why R&D and marketing began to work around the TPP process and overcome the functional rigidities it had imposed on their way of working:

For us it’s a cultural thing. It’s a mindset thing. You could have a completely rigid organisational structure around it but people would still want to share knowledge. We have a particular way of working within the company. Structure cannot stop us. We prefer to water down a rigid process.

The best practice community and other informal social mechanisms had begun to effect how R&D and marketing collaborate to acquire and assimilate external market knowledge and customer needs. Now, external market knowledge is captured jointly by R&D and the marketing business areas. As the R&D manager explains (RD1):

At the start of the projects we still have to go out, we “Go to Gemba” as the saying goes. But it is important we now have the same experience, so we all visit the same user, hear the same story – basically. Something happens when you hear the same person, hear the same words, have the same basis for discussion. It’s very different to reading from a slide show – or reading about user wants from two years ago.

If they could not go out together on customer visits, then R&D and the marketing business areas began to convene lengthy informal workshops to share their findings, debate the implications and contribute equally to the early phases of the TPP development, rather than allow the global marketing business areas to do this alone. The R&D manager also describes (RD1):

Recently, 25 people gathered for one full day discussing the market opportunities and the context behind them. Now we were extending beyond market insight to capture knowledge and perspectives from a variety of functions. We were enabling conversations

– is this old knowledge or something new – how does this fit with Strategy and so on. All of this came out of these sessions and they were really useful. We are in the process of undergoing a paradigm shift where the pendulum first shifted towards the global marketing teams, but now we are seeing the pendulum moving gradually back to R&D; we take a more shared responsibility now and try to do things together in the early phases – to capture needs – as a cross-functional effort – where we take shared accountability.

By 2009, a great deal of learning and introspection had taken place regarding the effectiveness of the formalized TPP process and structure. In summer 2009, a decision was taken to disband the Product Profiling teams in two of the three business marketing areas. Instead, the TPP process was now to be embedded within everyday marketing business area activities with the greater involvement of R&D. The process for acquiring and assimilating external knowledge of customer needs remains but it is less formal. In effect, the regenerative TPP dynamic capability itself had been assimilated within the marketing business areas and across the R&D concept generation/testing teams. The director of innovation, ostomy care (OC1) explains:

It is no longer the case that just one department in each of the marketing business areas is responsible for creating a TPP. Now, anyone within each marketing business area can initiate a TPP. Then, it is highly likely that that individual will recruit a cross-functional team from both marketing business areas and R&D to build a business case for the TPP. It is no longer a dedicated departmental role. It is something that is becoming embedded as a way of doing things. All team members in the marketing business areas should think in terms of creating TPPs with whatever knowledge inputs or learning they have.

Although the “After process” has only recently begun to emerge, next I summarise its characteristics

“After Process”: Summary

In Figure Seventeen below, I provide a conceptual representation of how the “After Process” now operates within *Medical One*, the roles of R&D concept development and the global marketing business areas and the types of external knowledge captured.

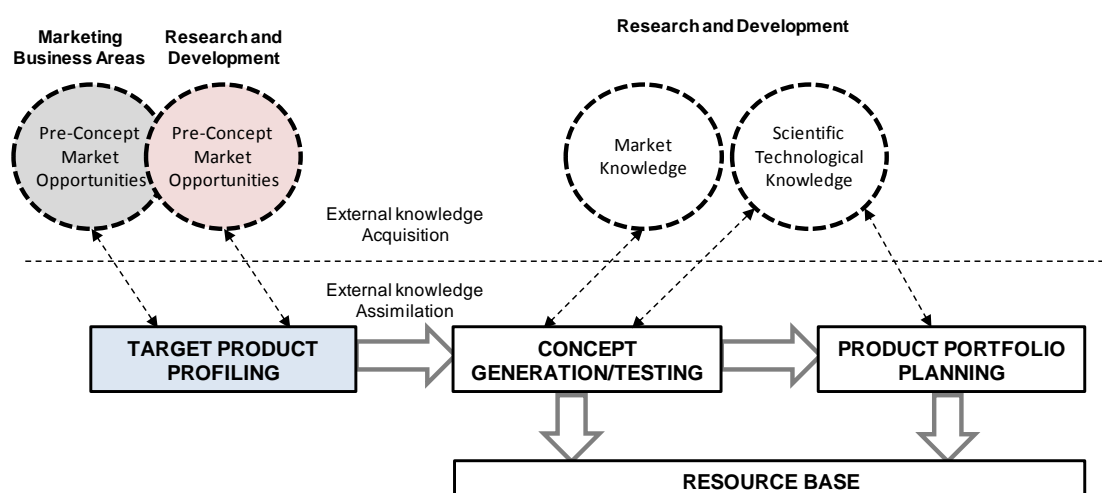


Figure Seventeen – The “After Process” in *Medical One*

The defining characteristics of the “after process” are as follows:

- *Medical One* devolved the responsibility of producing the TPPs to anyone within the marketing business areas. Any individual, using their knowledge and sense of market opportunities, could build a business case for a TPP with any member of their own or another marketing business area, as well as R&D.
- Cross-functional teams shared their existing market knowledge as well as embarked on joint knowledge gathering activities under the auspices of the Market Insight function. Members of R&D and the marketing business areas both visit and have dialogue with users and health care professionals together, so that the assimilation of new knowledge is achieved closer to the engagement with the customer. This ensures a higher rate of knowledge-sharing and faster TPP creation.

Reflections and resource base effects

The experience accumulated over the two years of the formal operation of the TPP departments has helped to evolve a new regenerative dynamic capability for sensing and shaping market opportunities. First, the new TPP dynamic capability for acquiring new external knowledge was developed and deployed using the ODI tool. Large amounts of knowledge were captured and market opportunities prioritized. This mirrors the acquisition capability construct in Zahra and George's (2002) definition of absorptive capacity.

With knowledge of market opportunities defined in the TPPs, the next stage was to assimilate this knowledge with the existing knowledge held by R&D. Equally, much of this knowledge was new to the marketing teams itself. However, *Medical One's* dynamic capability for assimilation of market opportunities had not been fully developed so its mechanisms for integrating the new knowledge was less effective than the mechanisms for gathering the knowledge itself. This led to power struggles between R&D and marketing, with the former still executing its own market knowledge gathering to support concept generation/testing.

What effect did the change have on other activities? What effect did it have on the existing resource base?

A number of resource effects arising from the regenerative TPP dynamic capability were discerned from the interviews. Briefly, these are:

- Acquisition of new codified knowledge of market opportunities. The knowledge base was renewed with new forms of codified customer need data. This codified data was blended with more qualitative insights to produce clusters of knowledge in the form of opportunity themes. These themes became discussion points and helped stimulate the articulation of existing implicit knowledge.
- New routines for the assimilation of external knowledge of customer needs with existing knowledge were developed.
- New forms of customer interaction fed the development of the target product profiles which acted as a new term of reference and renewed existing concept generation/testing and product portfolio planning incremental dynamic capabilities.

- Human assets were reconfigured and new complementarities between R&D and marketing functions identified. New forums for knowledge exchange were established in the form of best practice communities.
- New skills and competencies for identifying and measuring market opportunities were realised.
- New cross-functional insight into processes that work towards sharing and coordinating knowledge between functional teams.

In the final section, I summarise the implications of the above findings.

SECTION FIVE: DISCUSSION AND CONCLUSIONS

The case of *Medical One* provides empirical evidence to support a number of insights and discussions about absorptive capacity and dynamic capabilities in the literature. In this final section, I summarise my empirical contributions before reflecting on the limitations of my research and proposing next steps.

Origins of dynamic capabilities

The case highlights that dynamic capabilities can originate as a result of endogenous entrepreneurship rather than in response to an external event or in the context of a turbulent market environment. *Medical One* was trapped in a game of incremental innovation with slow growth and relatively stable markets. Managers wished to renew the firm's knowledge resources in order to identify new market opportunities and break the feature-based incrementalism which characterised its product development and the innovation activities of its competitors. This supports Eisenhardt and Martin's (2000) assertion that dynamic capabilities may originate in stable environments as well as turbulent ones.

The origination of the target product profiling regenerative dynamic capability in *Medical One* can be linked to the path dependency of its heritage and values of getting close to the customer, as embodied in its founder. Managers perceived that the existing concept generation/testing incremental dynamic capability was not reaching its fullest potential in discovering or exploiting customer needs. They made deliberate investments in setting up a new structure consisting of formal target product profiling teams and a Market Insight function. They shifted responsibility for the discovery of customer needs out of the R&D function and into the marketing business areas.

Constituents of dynamic capabilities

By adopting an absorptive capacity lens on dynamic capabilities, the *Medical One* case-study helps to shed light on some of the confusion in the literature regarding the constituents of dynamic capabilities. On the basis of the empirical evidence offered, I categorise these constituents into three groups, according to their particular purpose and content. These are developmental, deployment and learning mechanisms. Briefly, I describe each.

Developmental mechanisms

Developmental mechanisms consist particularly of search, sensing and exploration processes that influence the origination, intent and the early evolution of dynamic capabilities. They are similar to the first class of micro-foundations of dynamic capabilities described by Teece (2007) and are closely aligned with the acquisition construct in potential absorptive capacity. Teece (2007: 1322) elaborates:

To identify and shape opportunities, enterprises must constantly scan, search, and explore across technologies and markets, both 'local' and 'distant' (March and Simon, 1958; Nelson and Winter, 1982). This activity not only involves investment in research activity and the probing and re-probing of customer needs and technological possibilities; it also involves understanding latent

demand, the structural evolution of industries and markets, and likely supplier and competitor responses. To the extent that business enterprises can open up technological opportunities (through engaging in R&D and through tapping into the research output of others) while simultaneously learning about customer needs, they have a broad menu of commercialization opportunities.

Teece (2007: 1326) also describes these mechanisms as, “Analytical systems (and individual capacities) to learn and to sense, filter, shape, and calibrate opportunities.”

The market knowledge gathering activities undertaken by *Medical One*’s marketing business areas during the “change process” produced different forms of external knowledge that were new to the company. New tools and processes for engaging and learning from customers provided new insights on target innovation priorities based on a scoring of unmet needs. From these needs, *Medical One* was able to identify thematic innovation opportunities. The mechanisms it deployed for knowledge gathering, and making sense of the information captured, triggered the evolution of the Target Product Profiling dynamic capability. Also, the content of its resource base was enhanced with more codified forms of market opportunity data. The ODI process helped to codify external knowledge and distil market and customer insights into a format suitable for sharing between corporate functions within *Medical One*. Much of the literature on dynamic capabilities usually locates developmental mechanisms within the R&D function. The *Medical One* case study suggests that by shifting the locus of external knowledge capture (in this case to a function other than R&D), firms can begin to originate and evolve new dynamic capabilities to renew their resource base as well as other dynamic capabilities. Developmental mechanisms are concerned particularly with the content knowledge needed to operate and evolve dynamic capabilities within the firm.

Deployment mechanisms

Deployment mechanisms characterise the orchestration, integration and co-ordination processes that seek new configurations in the resource base, whether knowledge, existing capabilities or human assets. They aim to achieve continuous alignment and realignment of tangible and intangible assets (Teece, 2007).

The case of *Medical One* illustrates the deployment mechanisms needed to embed a regenerative dynamic capability and for it to become patterned and stable. A formal TPP process was created for this purpose. Based on the experience accumulated from its initial deployment, the development of new mechanisms for the assimilation of external knowledge with existing knowledge and the integration of R&D and the marketing business areas, this led to new working configurations and to different forms of internal communication for sharing knowledge. Ultimately, the formal TPP mechanisms were disbanded as R&D and the marketing business areas assimilated the process knowledge needed to co-ordinate their knowledge gathering activities. Deployment mechanisms are concerned particularly with the process knowledge needed to evolve and embed dynamic capabilities within the firm.

Learning mechanisms

The case of *Medical One* provides some insight of the interplay between knowledge accumulation, acquisition and assimilation and their role in the evolution of dynamic capabilities. It highlights a key absorptive capacity-based learning mechanism – assimilation – as a primary driver of dynamic capability evolution. Since 2007, *Medical One* has gone through extensive learning cycles to figure out what works best in its market knowledge gathering and assimilation tasks. As Zollo and Winter (2002) identify in their discussion of the evolution of dynamic capabilities, important collective learning has occurred as individuals in marketing and R&D engaged in formalized discussions to express their beliefs and opinions about customers and markets. This TPP process helped individuals to articulate implicit knowledge which was stimulated via through the production of new explicit, external knowledge. Through ODI, this externally-derived knowledge was codified for ease of knowledge sharing. This in itself acts as an important mechanism for knowledge evolution which underpins the evolution of the TPP dynamic capability. .

The case-study of *Medical One* identifies that when weak mechanisms of social integration exist within firms, they may hinder the evolution of a dynamic capability. However, such mechanisms may also have the opposite effect by surfacing power dynamics and conflicts that may ultimately lead to new deployment mechanisms which help to evolve a dynamic capability. The case-study here indicates that the assimilation of new knowledge with existing knowledge can make a significant contribution to the evolution of a dynamic capability. Through the experiences of individuals involved in the assimilation process, firms learn how to evolve a dynamic capability. In effect, social integration mechanisms for the assimilation of knowledge acquired (content) can create enhanced process knowledge on how to assimilate that knowledge (the process). I produce a framework of the dynamics of this relationship between absorptive capacity, content and process knowledge and its effect on the evolution of dynamic capabilities and the resource base of the firm in Figure Eighteen below.

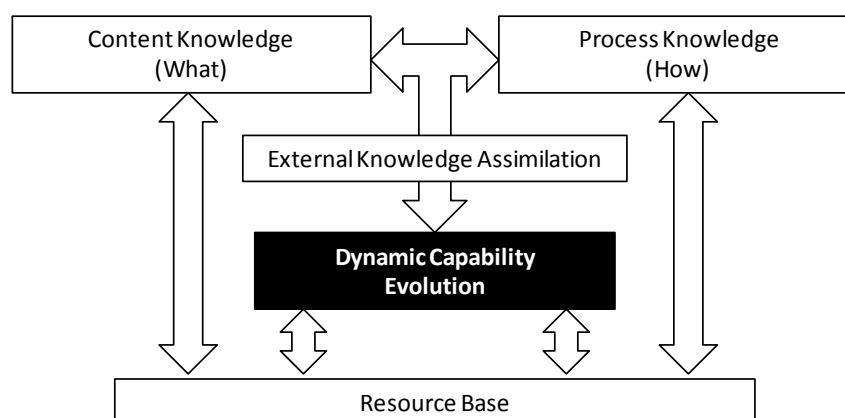


Figure Eighteen – A framework showing dynamics of the relationship between absorptive capacity, content and process knowledge and its effect on the evolution of dynamic capabilities and the resource base of the firm

More research into the effects of the assimilation of content knowledge on the generation of process knowledge may help contribute further to the understanding of the evolution of dynamic capabilities.

The formal assimilation mechanisms of the TPP regenerative dynamic capability led to a renewal of the *Medical One's* existing dynamic capabilities for concept generation/testing and product portfolio planning. It also challenged existing routines for gathering knowledge and helped evolve the company's operating capabilities for sensing and shaping knowledge of market opportunities. It will be interesting to determine the effect of this evolution on subsequent market performance of the firm's products. A director of innovation (WC1) concludes:

When we turned the organisation around, we had to realise how far we could go when we moved innovation out of R&D and put it into marketing. Top management emphasised this need but then in its delivery, we found it a lot harder. We had to get our knowledge base up to the right level to create customer understanding. Now we are probably reaching a situation where we can take the next step.

Next, I summarise the contribution of this case-study to the literature.

Literature contributions

I summarise the contributions of this case-study to the literature as follows.

First, I make an attempt to reduce some of the conceptual and definitional confusion in the current literature regarding dynamic capabilities. I do so by developing and then field-testing a conceptual framework for their study in the field. The framework aims to draw together different themes and perspectives concerning the origin, evolution, constituents and resource base effects of dynamic capabilities.

Second, I have examined the underlying mechanisms leading to the origination and evolution of dynamic capabilities through an absorptive capacity lens. I build upon recent literature on the absorptive capacity construct that calls for more understanding of how absorptive capacity can produce and develop dynamic capabilities. I have done so by studying processes of absorptive capacity beyond the traditional domains of R&D and scientific and technical knowledge found in the absorptive capacity literature. I also avoid the methodological preference for quantitative, descriptive studies by deploying a qualitative case-study method.

Third, with absorptive capacity as my lens – specifically potential absorptive capacity which is only concerned with the acquiring and assimilation of knowledge, I have revealed some of the constituent processes of dynamic capabilities. I have examined the underlying developmental, deployment and learning mechanisms that can drive the regeneration of existing dynamic capabilities, the creation of new regenerative dynamic capabilities, leading to a renewal of a firm's knowledge resources.

Finally, by focusing on dynamic capabilities as processes (or the “how” of change) and absorptive capacity of knowledge of customer needs as the content (or the “what” of change) that is flowing through those processes, I have made a tentative contribution to calls for the integration of the divergent research streams of strategy as process and strategy as content (Helfat with Maritan, 2007).

Managerial implications

The case-study provides a number of implications for managers wishing to develop a dynamic capability in their firms for sensing, shaping and developing market opportunities for innovation. These are as follows.

First, managers may “give birth” to regenerative dynamic capabilities for sensing and shaping market opportunities through deliberate investments and new organisational structures. They need not have to respond to exogenous market events to allocate resources to change processes and modifications to the firm’s resource base.

Second, managers should not expect regenerative dynamic capabilities to achieve their objectives immediately. Rather, they must set appropriate expectations and objectives for the individuals and teams responsible for implementing the underlying processes and mechanisms of such dynamic capabilities. They should facilitate active experimentation and learning through the accumulation of experience working with the new processes.

Third, managers may accelerate the evolution of a regenerative dynamic capability by paying particular attention to the cross-functional activities that are deployed to share and assimilate new external knowledge. By encouraging individuals and teams to experiment with ways to share new external knowledge, firms may accelerate the effect of regenerative dynamic capabilities on the resource base and in doing so, achieve superior innovation outcomes, faster.

Fourth, managers should be prepared to intervene to reduce the negative effects of centralising market knowledge gathering on inter-functional relationships. In particular, they should seek to understand the nature of the relationship between functions before removing responsibilities for knowledge gathering.

Fifth, the case-study highlights the importance of creating a corporate-wide, market-facing orientation where multiple functions are encouraged to engage with, and learn from, customers. Centralising market opportunity sensing into just one function may put unnecessary limitations on a firm’s market orientation, particularly when any new knowledge has to be assimilated within the firm.

Finally, I have provided a conceptual framework of dynamic capabilities which managers can deploy as a means to assess, organise, plan and execute change programmes within their firm. By identifying the effects of regenerative dynamic capabilities on incremental dynamic capabilities, the role of external knowledge assimilation processes and new knowledge content on the evolution of regenerative dynamic capabilities and their combined effects, the case-study provides a conceptual *modus operandi* for managers concerned with renewing the firm’s resource base to enhance enterprise performance.

Conclusions and limitations

In this research, I have tracked the origin and evolution of a dynamic capability that explicitly sought to enrich a firm’s knowledge base with new types of external knowledge content, in this case market knowledge. This differs from much of the absorptive capacity literature which tends to focus on the acquisition of similar types

of content (mainly scientific / technological knowledge) in order to understand the relationship of its assimilation to R&D intensity. By studying a change in both the form and the locus of external knowledge acquired within the firm, it is possible to identify the influence of absorptive capacity on the origin and evolution of dynamic capabilities. I hope that this finding will encourage further exploration of these linkages using similar qualitative approaches.

The limitations of my paper need to be acknowledged. I have grounded my analysis of the influence of absorptive capacity on the origin and evolution of dynamic capabilities in just one firm. Naturally, this limits the empirical generalization of my observations to one specific context. It may suffer from idiosyncrasies that limit its application in other situations. Therefore, before any general conclusions may be drawn, it should be noted that my generalizations may only be transferable to firms that have attempted to shift their orientation from a technological to a market-based one. The frameworks and models require testing in other contexts.

Also, I have only examined the effects of *potential* absorptive capacity (acquisition and assimilation of knowledge) on dynamic capabilities. It would be valuable to extend the study to assess the impact of the new capabilities derived from the new external market knowledge of customer needs on the performance of *Medical One's* new product concepts in the market place.

Next steps

More research into the effects of the assimilation of content knowledge on the generation of process knowledge may help contribute further to the understanding of the evolution of dynamic capabilities. A logical next step would be for me to triangulate the experiences of *Medical One* with those of one or two more firms. My research demonstrates the need for further developments in a knowledge process and content approach as a precursor for understanding the origin and evolution of dynamic capabilities.

Personal learning

I reflect on two aspects of personal learning when undertaking this research. First, learning connected with the literature review, and second, learning concerning the case-study methodology.

Literature review

It was fortunate that during the course of my case-study research, several new papers on dynamic capabilities appeared in a special edition of the British Journal of Management in spring 2009. These added a good deal of conceptual clarity to my research, particularly concerning the hierarchy of dynamic capabilities described by Ambrosini, Bowman and Collier (2009). This paper helped to explain the inter-relationships between different types of dynamic capabilities (regenerative and incremental) and in doing so, provided new structure and content to the second round of interviews with *Medical One* managers.

I had been surprised that the link between absorptive capacity and dynamic capabilities, although called for (Zahra and George, 2002; Lane et al., 2006), had not been examined empirically. This is likely to be because of the conceptual confusion that surrounds the dynamic capabilities perspective. Hence, it was essential for me to explore the perspective in detail in order to produce the clarity essential for the examination of their origin and evolution in this study.

Methodological learning

Between the two interview phases of the research phase (March to July 2009). I employed some analytic induction and constant comparative methods to cycle between induction and deduction in my analysis (Strauss and Corbin, 1998). I did this by iterating between the data from the first interviews and secondary materials and existing (and newly published) papers on dynamic capabilities found in the literature. I used my thematic analysis of the content of first-round of interviews to build my understanding of the gathering and assimilation of external market knowledge (absorptive capacity) within *Medical One*. Next, I began to make the connections from this learning to themes and constructs within the dynamic capabilities literature, particularly concerning their underlying learning mechanisms. I then introduced a more explicit dynamic capabilities perspective in the second round of interviews to validate the combined insights. It was through this cycle of reflection, learning and induction that I was able to determine the influence of absorptive capacity on the origin and evolution of dynamic capabilities. This approach in itself may be applicable to future research into dynamic capabilities. If I were to repeat the study, I would now have a clearer, more formal structure for the study of dynamic capabilities.

Appendix One – Discussion guide for first round of interviews

PART A: BACKGROUND

- 1) Please describe your role, the team / division you work in and how long you have worked for *Medical One*

During the interview, I shall be referencing customer / market insight. By this I mean *knowledge on user needs for strategy-making, concept-generation, research and development, innovation, brand development and marketing purposes.*

PART B: GATHERING OF NEW CUSTOMER / MARKET INSIGHT WITHIN MEDICAL ONE

This first section contains questions about the GATHERING of new customer / market insight within Medical One.

- 2) From your perspective, why is it necessary to gather new customer and market insight (remembering the definition above) within *Medical One*?
- 3) How would you describe the types and level of existing knowledge of customers and markets within your division?
- 4) Which types of knowledge do you find most valuable? Why?
- 5) Describe the current processes, capabilities, resources that are in place to undertake the gathering of new customer / market insight within *Medical One*?
- 6) Describe how your function supports activities for the gathering of new customer / market insight, if at all.
- 7) Describe to what extent you personally are involved in new customer / market knowledge gathering, if at all.
- 8) Describe how these processes and activities for GATHERING new customer and market insight have changed. Also, describe how you feel this process can be improved.

PART C: INTEGRATING AND SHARING OF NEW CUSTOMER / MARKET INSIGHT WITHIN MEDICAL ONE

This second section contains questions about the SHARING and INTEGRATION of new customer / market insight within Medical One. This can take place within your team, your function or across the company.

- 9) From your perspective, why is it necessary that new customer and market insight is SHARED within *Medical One*?
- 10) Describe the current activities, mechanisms and processes that are in place to support the SHARING of new customer / market insight within *Medical One*?
- 11) Describe how these processes and activities for INTEGRATING and SHARING new customer and market insight have changed. Also, describe how you feel this process can be improved.
- 12) Thinking of recent outcome-driven innovation customer needs provided to your team, describe what activities and processes the company took to share this data

internally. Who was the data shared with? How were other functions involved?
How did they react? What could have gone better?

13) Describe how you feel the sharing of customer / market insight can be improved?
Why?

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